The Builder.

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The National Physical Laboratory:

HAR too little is known of this admirable institution, which, although still in its infancy, has already accomplished a large amount of useful work in the interests of science, art, and manufacture. The establishment of the Laboratory was due in the first instance to the British Association. Sir Oliver Lodge, as Chairman of the Engineering Section, drew attention in 1891 to the need for such an institution, and in 1895 the late Sir Douglas Galton again brought the subject before members of the Association, with the result that a deputation was organised for the purpose of endeavouring to secure the support of the Government.

The upshot was the grant of the site and buildings at Bushey House, Teddington, a sum of 19,000*l.* for new buildings and equipment, and an annual Treasury grant of 4,000*l.* It is satisfactory to know that this amount will be increased to 5,500*l.* for the present year, and to 6,000*l.* for 1906 and subsequent years. Further, a promise has been made by the Treasury to ask Parliament for an additional grant of 5,000*l.* per annum for the next four or five years to be expended in the purchase of new equipment. We must point out, however, that even an annual grant of 6,000*l.* is little more than half the amount which is necessary for discharging the duties of the Laboratory, and that the provision of apparatus by instalments is a most undesirable way of going to work.

From the report of the executive committee presented on the occasion of the annual meeting held at Teddington last week we learn that the financial position during the early part of the year 1904 was a cause of some anxiety, but the large additions to the donation fund fortunately turned the anticipated deficit into a small balance on the right side. Nearly 6,000*l.* was received in the shape of fees for work done, and previous accumulations of income, amounting to about 1,300*l.*, have been applied to the purchase of equipment. A most striking difference is exhibited between the administration of this establishment and of Government departments. At Teddington prudent expenditure is followed by profitable results, while in Whitehall—as recent investigations prove — millions are wasted, with the result that nobody benefits but a few contractors. Consequently the Lords of the Treasury feel so poor that they regard the request for 30,000*l.*, made by the committee of the National Physical Laboratory in respect of new buildings and plant, as a "somewhat extensive programme . . . . which, having regard to the financial exigencies of the time and the numerous other demands on the Exchequer, can only be carried out by being spread over a number of years."

Foreign governments do not experience the same difficulty in affording adequate support to scientific institutions of national importance. Time after time we have shown the backwardness of our own Government in this respect. So far as national laboratories are concerned, we may here mention that the Reichsanstalt and the Aichungs-Kommission, supported by the Imperial Government of Germany, have received buildings and equipment to the value of nearly 250,000*l.*, and have annual grants of 16,000*l.* and 8,500*l.* respectively; in Prussia the Versuchsanstalt is provided with buildings and equipment which cost 137,500*l.*, and receives a grant of 15,000*l.* per annum; and in the United States the Bureau of Standards received 70,000*l.* for buildings, 45,000*l.* for equipment, and has an annual grant of 19,000*l.*

Owing to the inadequate nature of the equipment at Teddington the usefulness of the Laboratory is seriously curtailed. This is a very unfortunate state of things in an industrial country like Great Britain. The demand for scientific help in various industries has made marked progress during the last year or two, and unless this demand can be supplied its growth will inevitably be checked—a most disastrous contingency. At the present time requests for assistance from Government departments, local authorities, railway and other companies, architects, engineers, and contractors have often to be declined owing to lack of suitable equipment, and we quite agree with the remark made by Dr. Glazebrook at the last meeting of the British Association that "each time I reply to a genuine request for assistance 'No equipment' I feel I have done serious harm to the cause the founders of the Laboratory

had at heart when they pressed it on the Government."

Turning from this unsatisfactory position, it is gratifying to find in the actual equipment and work of the Laboratory every indication of continued progress. On the occasion of the annual meeting recently the different sections of the Laboratory were open to the inspection of the visitors invited, the director and his staff being present to explain the construction and objects of the machinery and apparatus. Bushey House itself is an old-fashioned mansion with outbuildings of ample dimensions, and is admirably suited for many purposes of the new institution, and here are to be found the various laboratories of the Physics Department. The Engineering Department is in a new building containing the boiler-house, engine-room, battery-room, engineering laboratory, drawing office, and a room providing temporary accommodation for the Electrotechnical Department. The Engineering Department also includes a small separate building known as the "lathe-house," in which is the newly-installed standard leading screw machine. The boiler-house contains a 100-h.p. boiler, supplying steam to a 75-kilowatt turbo-generating set in the engine-room, and steam for warming the engineering laboratory and Bushey House. In the engine-room there are also a gas-driven generator, and a booster set for charging the adjoining storage battery. The engineering laboratory is divided longitudinally into two bays, one being equipped with lathes and other machine tools, and one with testing appliances of different kinds. It cannot be too widely known that, in addition to original investigation undertaken at the initiation of the committee, the Engineering Department is entirely at the disposal of architects, engineers, and others who are willing to pay moderate charges for tests of apparatus, tools, and materials of construction. Appliances are provided for the testing of steam and vacuum gauges, indicators, indicator springs, steam, electric, and hydraulic motors, pumps, and water meters. Tests on the performance of cutting tools will be considerably aided by the new lathe specially designed for use with high-speed steel. Cylindrical, length, and screw gauges and scales can be compared and verified by the Laboratory standards, and any instruments that can be dealt with by existing plant will be examined, and certified if of sufficient accuracy. For testing materials of construction the equipment includes a 10-ton Buckton tensile testing machine, a 1-ton testing machine for alternate tension and compression, an impact testing machine built by the workshop staff during last year, the new four-throw machine for testing materials under rapid alternations of direct stress, a complete photomicrographical outfit for metals, and a machine for testing guttapercha in tension, this apparatus having been designed and made in the workshop. It is really a national reproach that the tensile testing machine should represent the largest appliance of the kind at the institution, especially in view of the fact that the Conservatoire des Arts et Métiers in Paris is now provided with a 300-ton machine. The testing of pipes and cylinders by hydraulic pressure up to 10 tons per sq. in. can also be carried on in the Engineering Department. The equipment also provides facilities for measuring the resistance of pipe coverings to the conduction of heat. In the lathe house, as already mentioned, is the new standard screw cutting machine, built by Messrs. Armstrong, Whitworth, & Co., the leading screw of which, having been calibrated and compensated, is now correct within about 0·0001 in. over a length of 36 in. At the time of our visit this lathe was at work on one of three certified copies of the original screw for the Royal Gun Factory. The machine is a wonderful example of accurate work. It is fitted with a microscope holder for purposes of measurement, and at the fixed rate of cutting the time necessary for the completion of one screw is between two and three weeks. A complete set of tools numbers fourteen, and 106 cuts are necessary, exclusive of those for rounding and undercutting the threads.

Under the head of research work the most important investigation in progress is that into the effect of wind pressure on structures. For the purposes of this inquiry a tower 50 ft. high has been erected in the grounds, and upon this plates and models of structures are mounted for examination, being secured to a revolving steel frame so that the objects can be kept normal to the wind during the observations. Up to the present the distribution of pressure and the total pressure on two similar rectangular plates—with areas of 50 sq. ft. and 5 sq. ft. respectively—have been partially investigated. From the results obtained so far it seems that the distribution of pressure on the windward side of a large plate in the open air is not identical with that over a small plate exposed to a uniform current, but the ratio of the pressures on the windward and leeward sides appears to be the same in both cases. Our present knowledge of wind pressures on engineering structures is largely due to the experiments conducted on models by Sir Benjamin Baker, and to the long series of observations made by Mr. R. H. Curtis, of the Meteorological Office. The inquiry now in progress at Teddington combines the principles adopted by these investigators, and we feel sure the results will be of much practical value to engineers and architects alike. When the tests upon flat plates have been completed, models of latticed girders will be examined, then cylinders and rectangular prisms, and finally the effect of wind pressure on oblique surfaces. The last two forms of test should be of particular interest to our readers, for in one case the objects will represent chimneys, towers, and kindred structures, and in the other the conditions presented by roof surfaces will be approximately reproduced.

In the way of steam research, work is now being undertaken with the object of determining the specific heat of superheated steam. Some most beautiful and delicate apparatus has been manufactured for the purpose of this inquiry by the Laboratory staff. The general mode of procedure is to measure the heat necessary to raise a known weight of steam from and to any defined temperature, the steam being heated by an electric current, and the energy required being measured by means of an accurate volt and ammeter.

The Physics Department of the Laboratory includes seven sections, some of which are further subdivided. We regret that it is impossible to do more than to mention very briefly the principal work engaging the attention of this department.

In the electricity division investigation has been made into the mercury standard of resistance, and the standard ampere balance, designed by Professor Ayrton and the late Principal Viriamu Jones, has been completed for the British Association of Electrical Standards. A useful investigation conducted in the electrotechnical division was one for the Engineering Standards Committee as to the properties of insulating materials in generators and motors. Research has been made in the thermometry section on the measurement of high temperatures of 1,800 deg. to 2,000 deg. C. In the metrology division numerous sets of templates and gauges have been verified for the Engineering Standards Committee, but the most important work was the calibration and compensation of the master screw of the standard leading screw machine in the lathe-house.

Two researches have been completed in the metallurgical division, one being an examination of the properties of nickel steels prepared by Mr. R. A. Hadfield, and the other an important study of tool steels. Photometric and other tests of incandescent lamps formed the chief work of the optical division. The foregoing items constitute merely a portion of the work performed in the Physics Department, and it should be noted that they are quite additional to the testing done for various authorities and business firms. During the year about 28,000 instruments were examined, including thermometers, optical instruments, watches, sextants, barometers, electrical apparatus, and measuring instruments.

An extensive programme of work for the present year is now being attacked by all departments and divisions of the Laboratory, and we confidently anticipate that the results reported at the next annual meeting will be even more encouraging than those which we have very inadequately described in this article.

QUEEN VICTORIA MEMORIAL, SHEFFIELD.—On May 11, H.R.H. Princess Henry of Battenberg will visit Sheffield to unveil the memorial of Queen Victoria which has been erected by public subscription on a site in front of the Town Hall. The memorial consists of a bronze statue of the late Queen, with emblematical figures of Maternity and Labour, by Mr. Alfred Turner.

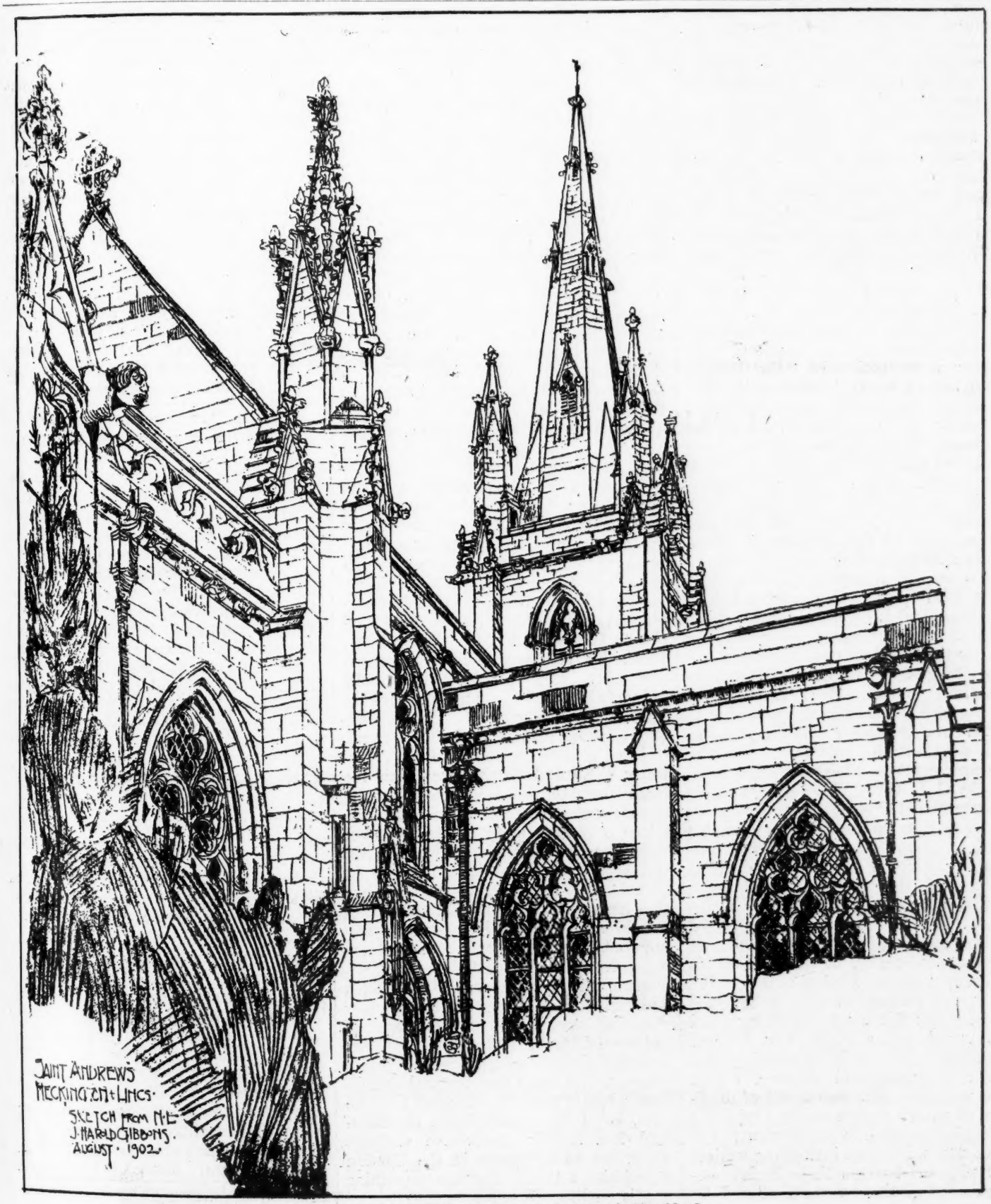
WORDSWORTH'S HOUSE, PENRITH.—We read that the Penrith Urban District Council have confirmed, by a majority of three over five votes, their project to carry out considerable alterations of both the exterior and the interior of Wordsworth's house at Penrith for municipal purposes. Their Sanitary Surveyor and Engineer has prepared a scheme for a new elevation of the front, to replace the façade which was designed by Robert Adam. The Council's proposals have aroused the protests of the National Trust, the Society for the Protection of Ancient Buildings, and, we understand, Professor Baldwin Brown, on the grounds that the house presents an example of the work, gradually increasing in rarity, of a great architect, besides its associations with the memory of the poet.

TWO SKETCH BOOKS.

THE vitality of the "Architectural Association Sketch Book" is something most gratifying to contemplate. After all the years that it has been going on, we have here a volume* which has never been surpassed and perhaps hardly equalled for the general excellence of the draughtsmanship. Many great subjects for illustration have of course been practically exhausted, but it is no disadvantage to have some less known or less often illustrated examples of architecture.

* The Architectural Association Sketch-Book. Third series; vol. viii.; 1904. Edited by W. G. B. Lewis and William A. Pite. Published by the Architectural Association.

Judging from the contents of the volume, it is obvious that the interest in Gothic architecture, at all events as a subject of study and illustration, has not evaporated, in spite of the fact that Gothic as a modern style is so much less practised in the present day. And among the illustrations of Gothic architecture we must mention with especial appreciation the reproductions from pencil sketches by Mr. C. Wontner Smith, who for picturesque style combined with correctness of perspective delineation may perhaps be said to be the best contributor to the volume. His sketches of the west window of Campden Church, with its centre buttress rising so oddly off the hoodmould of the doorway; of the south transept of Minchinhampton; and of the south porch of Northleach, are, as pencil sketches, as good as they can be; the last-named, which in free and expressive style is the best of all, being however slightly marred by not being quite upright on the paper, an accident which might, we should have thought, have been easily corrected in reproduction by an alteration of the margin line, though in other respects its reproduction by Messrs. Sprague is admirable. Mr. Wontner Smith is also to be credited with an excellent pencil sketch of a fine piece of Renaissance work, the choir stalls of San Georgio Maggiore, Venice; a subject more difficult to the draughtsman than the Gothic



From the Manchester Society of Architects' Sketchbook.

ones. Among the other pencil drawings two of the finest are contributed by Mr. Theodore Fyfe. One of these, the Palazzo Costabili at Ferrara, is an excellent example of the kind of sketch which, while slight in execution, conveys the whole facts in an effective manner; it is an example of the art of knowing where to stop in what is avowedly a sketch and not a finished drawing. In illustrating a building of which the most important feature is a very bold horizontal cornice, the author has appreciated the advantage of a standpoint near the building, showing the projection and strong line of the cornice in sharp perspective. Another of Mr. Fyfe's contributions is a fine pencil sketch of the Arch of Trajan at Beneventum; a much more difficult subject than the Ferrara building, and very finely treated. Of this we have given a reproduction in one of our plates in this issue, as an example of the work to be found in the present volume of the Sketch-Book.

Fairford Church receives a good deal of attention. Mr. Gillespie gives a measured drawing of the screen, and details to a larger scale, of which the washed drawing forming Plate 8 is very bold and effective in execution. We come into another world of architecture in Mr. Horace Cubitt's measured drawings, in ink line (which best suits this class of subject), of "The Queen's House, Greenwich." This is a very prosaic affair compared with the buildings we have above referred to; it is completely a production of "the Renaissance box of bricks," but it shows the value of proportion and simplicity, especially in the contrast between the treatment of the windows in the lower rusticated portion of the wall and of those above. Mr. Winton Newman contributes an excellent and most fully worked-out set of measured drawings of an angle of the cloisters of Westminster Abbey, which, with less of the charm of draughtsmanship, represents more hard work than anything else in the book, and is highly creditable to its author. The drawings comprise six sheets, two of them of mouldings; and everything is shown in the most conscientious manner. Then we come on the somewhat less interesting subjects of St. George's, Hanover-square, and St. James's, Piccadilly; measured drawings, the former set by Mr. Callow, the latter by Mr. C. L. Gill. These are admirable congregational churches for modern worship, a practical merit which the mediæval type of church seldom possesses; yet, coming after the intensely vital architecture of the Westminster cloisters, it must be admitted that they strike upon the mind as strangely artificial and conventional; and the tower of St. James's—really, in spite of Wren's name, is there any kind of beauty in it? Wren did produce some very beautiful steeples, but this is not one of them, and one would rather forget that he was responsible for it; it is certainly not worth measuring and drawing, except as a warning. Mr. Rollo's set of drawings of an old Scotch castle, Craigievar (including a complete set of plans) is of value not only as an interesting subject in itself, but because these feudal residences are getting so much altered by modern owners. The plans of Craigievar, both in their original features and the obvious and not altogether successful struggle to fit them for the requirements of modern life, form a very interesting study. There would be a kind of glamour in living in such a house, but it can hardly be very convenient; let us hope the glamour atones for the inconvenience.

Mr. Fulton has drawn a fine and effective title-page to the new volume, with a large draped figure seated in an architectural framework, and a great deal of smaller detail which is very clever and effective; but the lady (who we suppose represents "Drawing") might have been just as effective with rather more attractive features. The drawings are reproduced partly by Messrs. Kell & Son and partly by Messrs. Sprague & Co.; and both firms have done their work admirably.

The Manchester Society of Architects has also started its "Sketch-Book," of which Parts I. and II. are before us. The first part consists entirely of drawings by Mr. Harold Gibbons, selected from those for which he received the Pugin Studentship. These are pen-line drawings, and include both measured drawings and perspectives. Chetham Hospital, a subject which comes naturally in the way of a Manchester architect, forms the subject of three plates. There is a carefully-drawn perspective of part of Winchester Cathedral. The largest and most important drawing is a very elaborate and careful one, filling a double page, of the celebrated sedilia of Heckington. Mr. Gibbons is a most precise and accurate draughtsman, but his style in perspective work is rather hard and ineffective; and whether it be the fault of occasional weakness in the lines of the drawing, or whether it is the fault of the lithographers, we cannot tell, but the reproductions are not as clear or sharp in many places as they should be. Part II. contains an exceedingly neat and highly-finished measured drawing and details of an oak screen in Manchester Cathedral, by Mr. F. P. Oakley; these, by the way, have reproduced admirably, and therefore the partial failure in the others is apparently not the fault of the lithographers. For all ink-line drawings that are to be reproduced, it is of great importance to have perfectly clean and precise lines with the same strength (or blackness) of ink; if this is not the case, the drawings themselves may look quite satisfactory, but the reproduction will be uncertain. Mr. Oakley's third drawing, the screen at Carlisle, fails somewhat in the reproduction from another cause, that of having too close work for the degree of reduction required. Several other measured drawings of screens are contributed by Mr. Vernon, Mr. C. Paterson, and Mr. Holt; and Mr. G. S. Solomon contributes four sheets of careful measured drawings of Tideswell Church, Derbyshire. Measured drawings are no doubt the most valuable things to put in an architectural sketch-book; but it must be admitted that we miss, in the Manchester book, the beautiful and artistic perspective sketches which are so attractive in the London Association's book. Perhaps something of this quality will follow in time.

NOTES.

The Discussion at the Institute. WE cannot let the occasion pass without a word in recognition of the spirit of Professor Beresford Pite's speech at the Institute on Monday night, in which he sarcastically commented on the rare recurrence of evenings like that, when they discussed subjects which really had something to do with "the advancement of the art of architecture," and went back contentedly again to "political squabbles," until in two or three years' time there would be another paper that had something to do with the art of architecture, followed by another relapse into "political squabbles"—and so on. We sympathise entirely with the spirit of Mr. Pite's remarks. Nothing seems to us more dull, more uninteresting, more unworthy of serious attention, than the argufying and polemical talking about points of procedure, and professional etiquette, and professional practice, etc., which occupy so much attention at the Institute, and in which some natures seem to find so much pasture. It is not what the Institute was instituted for, as Professor Pite by implication reminded the meeting. One is obliged to report these vain wranglings, but there is no pleasure or satisfaction in doing it, and we hope Professor Pite's eloquent protest may not altogether fall to the ground. It is gratifying, at all events, to find that the character of the papers read last Monday had attracted a fuller meeting than usual.

The London Topographical Society. THE London Topographical Society gave a conversazione on the 16th inst. at the Drapers' Hall. The guests were received by Lord Rosebery in Mr. Jackson's graceful staircase hall; and in the large hall there was arrranged a collection of maps, drawings, and engravings of old London and historical personages and events connected with it. The collection fell into three different categories: (1) maps and drawings relating to London as a whole; (2) maps and drawings relating to particular districts; (3) original drawings of Old London. Stretching along a screen the whole length of the Hall and halfway back again was the series of sheets of the plan and elevation of the road from Hyde Park Corner to what is now Addison-road, executed for the Kensington Turnpike Trust.* The maps were a very fine and valuable series, the principal use of which on such an occasion, perhaps, is to stimulate the interest of those who have not yet given attention to the subject, by showing them what an amount of history in the shape of maps of London exists; to study and follow them out at a single evening's entertainment would of course have been impossible; but it is well to bring them into public notice in this manner. The section of illustration of special districts was mainly represented by the collection of memorials of Marylebone made by Mr. Ashridge, the surveyor to the Marylebone Council, who in carrying out this excellent work has set an example which every London Borough ought to follow. London is now getting

* A portion of this was reproduced in our illustration plates some two or three years back.

so rapidly altered that every record of a past age should be seized upon and preserved in illustration before it is too late. Among the numerous illustrations other than maps many of those connected with Regent's Park site, before and after the formation of the park, have much both of landscape and of social interest. Among them were drawings of that extraordinary and fantastic erection called "The Colosseum," all memory of which has died out, but which was in the thirties the fashionable resort of the upper class of pleasure-seekers. We are somewhat more sensible in our amusements now; it is doubtful if such a "folly" as the Colosseum would attract London Society in the present day. The plan of the "proposed Royal Champ Elysées (*sic*), to stretch from Park-place to Hampstead Hill, is a fine idea, and if a Napoléon had ruled in London, it would have been carried out. The entertainment was varied by the performance of an excellent little string band in one of the rooms, and by the sight of the very fine old Gobelins tapestries hung in the same room. The only drawback on the occasion was the rather thin attendance. It was evident, from the extensive perspective of refreshment tables, that a much larger attendance had been counted on, and it should seem that the subject of London topography does not interest many people. It is to be hoped that the Topographical Society will not be discouraged from trying again, and will have a better response next time. We can assure those who were not there that there was matter of interest for much more than an evening's study.

The Central Hall at the Law Courts.

THE authorities of the Royal Court of Justice seem to be about to alter the position of the statue of the late Lord Russell of Killowen, for the purpose of placing it in a better light. Unfortunately, whether it be in a dark or a light place very few persons will see it, since the attendants are pretty nearly the only people who ever enter the Central Hall. We say nothing here as to whether or not this Central Hall is suitable, having regard to its size, to statuary, but the point to be emphasised is that it is something of a mockery to commemorate great lawyers by statues which are scarcely noticed. It is high time that an attempt should be made, under the direction of some eminent architect, to effect an alteration in this Central Hall by means of a staircase opening out of the north gallery. It does not seem by any means impossible to effect such an alteration—not by a mean rathole of a staircase such as exists at present, but by a design in harmony with the building and of a dignified character. The wretched post-office which now fills up part of the north corridor could then be removed into the Central Hall or placed behind the staircase; at any rate, such a staircase would connect the Central Hall and some of the principal Courts, and might lead, if successfully carried out, to something of a similar connexion between the Central Hall and the west and east Court corridors.

Artificial Paving.

LARGE quantities of artificial stone have been used for paving public footways during the past thirty years, even in many of the large towns which are situated in flag-producing districts. A report made by the City Surveyor of Manchester contains a useful summary of the opinions expressed by about 300 borough engineers upon the relative merits of artificial and natural stone for paving purposes. While the views so presented are by no means unanimous, there is sufficient evidence in favour of the former when made of suitable materials. Experience shows that as a general rule concrete flagging will last with fair wear for about twenty-five years, but that slabs made from destructor clinker do not last so long as those in which stone chippings form the aggregate. The percentage of material damaged in lifting and relaying over pipe trenches is considerable, and in places where heavy packages are dropped upon the footways artificial flags are very liable to damage. The first of these disadvantages could easily be remedied by adopting lime mortar instead of cement as a jointing material, and both of them by reinforcing the slabs with steel. Municipal authorities in the United States have already recognised the advantages to be gained by the adoption of concrete-steel in paving, but in this country the only effort to counterbalance the brittleness of concrete has been in the direction of increasing the thickness of the slabs to 4 in., and even to 6 in. This is clearly a waste of material, and constitutes one more proof of the backwardness of engineers to avail themselves of the obvious advantages offered by the judicious incorporation of steel with concrete.

The Rating of Electrical Machinery.

THE paper read by Mr. Rud. Goldschmidt to the Institution of Electrical Engineers on "Temperature Curves and the Rating of Electrical Machinery" is of value to engineers, although physicists may be startled by the assumptions made in it. The output of an electrical machine is generally limited by the maximum permissible rise of the temperature of its field coils and armature. Engineers generally specify that the temperature must not exceed a definite amount after working for six or twelve hours at full load. It is of great importance for designers, therefore, to be able to predetermine the temperature rise, and they will find Mr. Goldschmidt's paper very helpful. It is a little misleading to say that approximate methods are preferable to exact mathematical ones as they enable us to keep "in closer touch with the real physical phenomena." If the author means that the engineer, using mathematical methods in which he has little faith, will be compelled to pay more attention to experimental results and less to calculation we agree with him. The author surely does not mean that the more assumptions we make the more do we get into touch with the physical phenomena. As a matter of fact the law on which he constructs his curve for the steady temperature was given by Sir Isaac Newton, who mentions its limitations. The curve itself is the well-known exponential curve. We were interested to find how closely the experimental curves obtained by the author agreed with it. A mathematician, however, would be able to draw a portion of a parabola or a hyperbola which might fit into the experimental curve even more closely. We cannot agree that the power dissipated per unit surface depends only on the difference of the temperature of that surface and surrounding objects. A black surface dissipates more heat than a polished surface. The subject of the rating of electrical machinery is one that has not been sufficiently studied. Mr. Goldschmidt's paper, notwithstanding its limitations, is a good introduction to the subject.

Society of Arts.

ON Tuesday evening Mr. F. Bligh Bond read an excellent paper at the Society of Arts on the subject of "West-country Screens and Rood-Lofts," of which he has made a special study. He gave a sketch of the history and development of the rood-screen and of its artistic treatment, remarking that wood detail began as an imitation of stone, but we found it becoming gradually more adapted to the nature of the material, and in the fully developed west-country type of screen there was a close correspondence between the design of the woodwork and the nature of the oak in which it was wrought. This, he thought, was by no means so completely the case in other districts, where the detail was often too imitative of stone-work — buttresses, battlements, etc., reproduced on a minute scale. Though much mischief had been done not only by the destruction but by the hasty and injudicious repair of many of these screens, sufficient remained to form an artistic storehouse of great value, and of high importance to those who were seeking to revive the beautiful handicrafts which were the pride and joy of our forefathers. The paper, which is well worth attention, will of course be printed in full in the Society of Arts' *Journal*. Mr. G. F. Bodley occupied the chair on the occasion.

Mr. Fraser's Exhibition.

AT the Fine Art Society is to be seen a fine collection of water-colours by Mr. John Fraser, a sea-painter whose powerful work is far less generally known than it should be. Mr. Fraser's greatest successes have been in oil-painting—or at least we should have said so but for the large and grand water-colour here under the title "Morning after a Heavy Gale" (25). This, which is on a far larger scale than is usual in water-colour "marines," is a most impressive work, not only in the way in which the weight and momentum of the large waves are conveyed, but in the lurid and threatening look of the whole scene: it is one of the most real things we have seen in sea-painting. "A Summer Gale, Newhaven" (57) shows finely another aspect of the sea in rough weather. Among the smaller works are some beautiful bits of composition; we may mention especially "On the Hamble River" (14); "The Ouse at Piddinghoe" (22); and "Wet Morning, Brighton Beach" (28), the last a capital instance of the effect which may be produced by a very slight sketch in which truth of colour and atmosphere are preserved.

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The New York Water-colour Club.

THE first exhibition in England of the New York Water-Colour Club, now on view at the Modern Gallery in Bond-street, is an artistic event of some interest. Considering the tendency of American artists to follow French models in everything, we cannot be surprised to find that there is little representation of what we in England are accustomed to consider the true and pure school of water-colour painting; the general style of work is quite different from that which prevails at the gallery of the Society of Painters in Water-Colours; there is none of the transparency of effect which we see in the best English water-colour landscapes, many of the drawings having in fact hardly any of the look of water-colour about them. There is however a high standard of excellence in its kind in the collection, which is quite worth a visit. Still Life subjects (not very numerous) are all good. There are some powerful figure pictures—Mr. Herter's "Sorrow" (3); Mr. Irving Couse's "Roasting Corn" (46); and Mr. Franzen's "Late Afternoon" (76), may be mentioned, though the last-named is entirely without what we call the quality of water-colour. Mr. Potthast's "Moonlight Sail" (59), in which two figures show in dim light on the stern of a boat, is a fine work both in composition and effect. The habit of filling in the lights between trees, for example, in body-colour, as in Mr. Palmer's "The Cedars" (60), an English critic has no right to quarrel with, since some of our own younger artists have adopted it; but it is a rather factitious way of getting an effect. Mr. Palmer's two snow pictures (41 and 47) are brilliant in effect but owe much to body-colour. In short, this is a very interesting exhibition, but it is not what we should call a water-colour exhibition.

Old-World Gardens.

THE painting of gardens is becoming almost a characteristic of the present day, several water-colour artists having made it their special province. Mr. E. Arthur Rowe, who is one of the ablest and most devoted of the garden painters, has a collection of drawings of this class at Messrs. Dowdeswells' Gallery, which contains a great deal of excellent work, mostly in the painting of formal gardens in which the heavy (and we think in some cases ugly) masses of clipped greenery form the background or framework for the play of the light and colour of flower-beds. The famous garden of Drummond Castle furnishes several subjects; also Hampton Court, the illustrations of which are among the best things in the collection. Where the author introduces the old house or castle as part of the scene, he shows also that he knows how to treat buildings in water-colour; the buildings in "Crathes" (26) and "Drummond Castle" (60) are as well treated as the gardens.

Water-colours by two Ladies.

MISS KATHERINE MCCRACKEN and Miss Nellie Hadden have a small joint exhibition at the Modern Gallery. Miss McCracken's are chiefly landscapes or bits of Italian cities; both classes of subjects are treated in a sketchy but artistic manner. Miss Hadden, who deals chiefly with animals, is much more accomplished in technique; her horses and dogs are about as good as they can be, also the two highly-finished studies of lizards; and the giraffe looking in at the window at two others—"an old resident inspecting the new arrivals," is almost laughably true to giraffe life and manners as they can be studied at Regent's Park.

The President's Soirée.

THE President of the Institute of Architects and Mrs. Belcher received a large party of friends on Tuesday evening at the Institute of Chartered Accountants, arrangements having been made with that body so that Mr. Belcher could have the satisfaction of welcoming his friends in an *encadrement* consisting of his own architecture. The company were received by Mr. and Mrs. Belcher in the characteristic domed apartment which forms the Council Chamber. There was music in the large hall, followed later by dancing. Flowers were profusely and picturesquely distributed on the staircase and elsewhere, and there was supper in the library, to our thinking the most charming interior of all, with its characteristic balustraded bridge across the middle connecting the two upper book-galleries. It was a most successful and pleasant entertainment, enjoyed, we may venture to say, by all present.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 19, Conduit-street, Mr. J. Belcher, A.R.A. (President), in the chair.

Mr. Graham announced the decease of Mr. Chas. Bennett Arding, Associate, elected 1857, and Professor Ludwig Peter Fenger, of Copenhagen, hon. corresponding member, elected 1886.

Decorative Painting.

Papers were then read on "Decorative Painting" by Sir Wm. Richmond, K.C.B., R.A., Mr. Alfred East, A.R.A., and Mr. Solomon J. Solomon, A.R.A., of which the following are abstracts:—

Sir Wm. Richmond, in his opening remarks, referred to the ties which united the arts of architecture, sculpture, and painting. The votaries of architecture were builders who designed and erected, sculptors who designed and carved, painters who enlivened its severe spaces with the glory of colour, craftsmen who brought glitter and sunlight into the darkest nooks as rays of light into a cavern. Late in history architecture had wished to go alone. Hence arose the danger that ornament might be stereotyped and of trade manufacture, painting cease to add its magical charm, and sculpture be relegated to an independent and solitary mission. But a return to a healthier union of the arts was in progress—thanks in a large measure to the Institute, which, more than any other artistic institution in Great Britain, was encouraging "fraternity," and taking more and more sculptors and painters into its confidence and within its ranks. Hence the Institute was becoming stronger, broader in view, larger in artistic enterprise; and the sculptors, painters, and craftsmen whom the Institute had honoured by electing among them were gratified. The great traditions which bound the past of architecture, sculpture, and painting had been kept alive by a few serious workers who did not believe that a new art was possible, any more than that a new man could be created. The great principles which had made art to be the highest factor in true civilisation would grow in usefulness as their exponents gathered together in closer bonds of sympathy. Union is strength. They had to educate an inert public to use their higher faculties, to cultivate their observation, and enjoy in peace what was permanent and beautiful.

Coming to the special branch of the arts he was to discuss—viz., decoration, which included mosaic and mural decoration—the author said he feared that the delightful method of "buon fresco" was for the present an impossible one to pursue in London owing to the vitiated atmosphere produced by disintegrating acids which were destructive to lime; but in the country, where pure air was obtainable, "buon fresco" might be adopted for interiors with as much security as in Italy in times past. Provided there was no poison in the atmosphere, damp was the only enemy to fresco. The author gave particulars as to the preparation of the walls to be decorated, what materials to use and what to avoid, the method of applying the colour, etc. To be successful, all preliminaries, studies, and cartoons must be absolutely certain both in their relation to design, forms, and colours; so that the painter when he paints has only to think of his difficult but most fascinating technique. Sub-division of the various stages of development must be rigidly adhered to.

Mosaic is as adaptable to exteriors as to interiors, but to be effective mosaic must be used lavishly, as in S. Mark's, in Santa Sophia, and in many churches and chapels in Ravenna. But mosaic demands *another* kind of design and drawing from any other material for decoration. The translation of pictures into cubes is obviously absurd. Mosaic can do what no other method is capable of, but it cannot imitate excepting inadequately. The design must be clear, the drawing severe, the accidents few, the light and shadow rare. An architect should build for mosaic decoration if he intends to use it. He should give plenty of domes, semi-domes, alcoves, because mosaic looks best upon curved surfaces, where it is least likely to come into competition with pictorial design. A building to receive mosaic should have few mouldings or frames; the framing of mosaic pictures should be executed in mosaic, and string-courses as well as mouldings should be so designed as to be in harmony with the style which is essential to mosaic, and that is *severe*. If the architect decides to make a sumptuous piece of coloured decoration, he and the other artist, his coadjutor, must work together, from the first initiative to the last point of completion, if the final result is to be severe and homogenous. The architect must consider his decoration while he is initiating the plan for his enterprise as well as the elevation. In a well-built mosaic the construction is never hidden or the joints concealed. The mosaics that look best from a distance have a good wide joint between every cube.

The next best method for wall decoration to "buon fresco" is tempera painting upon a dry wall of lime and marble dust. The tempera used is the yolk of egg only, not the white. When dry this becomes as hard as the hardest varnish. The yellow tint gives a very agreeable tone to the white lime. Almost all colours can be used with egg. Egg painting has stood the test of time; many of the wall paintings at Pompeii are alone in egg, and all the tempera pictures and wall-paintings in Italy which are not fresco or wax are painted with egg tempera.

Wax painting is another method well suited to our climate. The method, technical details of which were given by the author, may be seen in the National Gallery exemplified by portraits on wood of the IInd century B.C., and in many of the wall-paintings at Pompeii and Herculaneum. The author said he had tested some Egyptian wall-paintings and found that they were executed in wax and spirit. Wax-painting is perfectly durable on a wall, but not on canvas. In England it would be advisable to burn the wax well into the wall with artificial heat. Oil painting should be entirely abjured in decoration.

All decoration should be done upon the wall where it is subjected to environment, and not be *applied*. Notwithstanding personal discomfort, painters should execute their works *in situ*—even in a dark corner, because that dark corner is the place of the picture, which if painted in full light of a studio will be quite disappointing when it is placed in an obscure light. The same law of fitness holds good as regards sculpture. A statue designed to be set in a niche should belong to it and to nowhere else—more, it not only belongs to its immediate, but to its less immediate surroundings also, and is out of place away from there.

Treating of colour in architecture, the author said that, being unaccustomed to it in modern times, prejudice was strong. Some would doubtless be shocked if they saw the Parthenon,

Westminster Abbey, and most of the English cathedrals highly coloured; but there is no doubt that they once were; and, further, that uncoloured buildings are of modern invention, dating from the late XVIth and early XVIIth centuries, at the period when both sculpture and painting were growing away from structures to the detriment of all the arts. The geometric or architectonic treatment of pictorial design in England has been extremely rare. All designs, from Giotto to Raphael, either in fresco or tempera, are decorative in the distribution of masses of colour, of shapes of silhouettes; they are more or less conceived geometrically, however cleverly the geometry may have been concealed. The early English decorators were extremely interesting colourists—the decoration of the Angel Chapel in Winchester is an admirable example. It consists mainly of pale, middle, and red ochres and white. The author thought that the tone which appears to be blue from below is composed of nothing but black and white, which among warm tones is a mixture which produces a very gentle and refined blue. Judging from the specimens that remain, the splendour of the celebrated wall-paintings in Athens has not been exaggerated by historians.

Mr. Alfred East, A.R.A., took for his branch of the subject "Landscape Painting as a Medium of Decoration," and showed that it had been almost ignored as a medium of decoration. The architect, like the figure-painter, had kept it strictly in the background. He put the question seriously to architects: Is there no room for landscape painting as a medium of decoration? Would it hinder the aim and intention of the architect to use it to decorate his buildings? Could not it conform to all his conditions as to scale and colour? Nature has an unbounded range, from the winter's snow to the full rich tones of the autumn, and between these seasons she offers an inexhaustible supply of beautiful and suitable arrangement of form and colour. The architect may desire a certain colour arrangement to complete the object he has in view; he never thinks that he can find what he wants in landscape. He has the right to demand certain conditions as to scale. To accept those conditions, to work within them so that there is no apparent effort in so doing, is in itself an artistic accomplishment. The architect has no reason to fear that in the adoption of landscape he endangers any of these principles; he may find in such decoration the sentiment of his architecture, the purpose of its being. If he has built a place of worship there is absolutely no reason why the walls or windows should illustrate the lives of the saints. There are things in nature which suggest a lofty purpose in their creation, and which reveal the high purpose of the Creator. There are also the materials in nature by which the artist can convey a sentiment as pure, as high, and as noble as a composition of figures could do. An architect would not tolerate any loud assertiveness of decoration whose anecdote completely distracted the attention of the spectator from the fine proportion of his building. He was not annoyed like the painter when the spectator remarked, "What a beautiful frame!" Nothing should hinder the conception of perfect completion wherein all the arts which are employed for a final end should sing together. A building was artistically complete where everything was in its right relation, where all the values were just. The author contended that his claim for the consideration of landscape painting as a medium of decoration was that it could conform to give high purpose, and that it did conform to give just demands.

Mr. Solomon J. Solomon, A.R.A., first dealt with certain objections raised by architects when discussing decoration. With regard to the argument that the finances at the architect's disposal did not admit of the inclusion of the painter's art into his schemes, he suggested that as the edifice would outlive its author, he might be permitted to provide for its future. Take a building of a national character. He should be permitted to allot some spaces to indicate to future generations the lines upon which the work should be carried on; in fact, broadly to indicate the kind and style of decoration he would have others introduce. Another fault found was that our variable climate played tricks with existing canvas decorations, causing them to sag and loosen. The fault lay with the use of too large a surface of canvas, when sometimes the architectural features which should be real are imitated by the painter. When, as on the great ceilings of the Doge's Palace, a vast panel-work was designed to contain pictures of varying shapes, such as oval, octagonal, oblong, square, and others conforming to the spaces of the interstices left when the surface of painting is but a third of the whole, little real danger would result. Again, few practical men would use a fresco ground for painting when the "mat" surface, its chief quality, can be obtained by the use of suitable mediums, and when far greater richness of effect can be produced by other methods ready to our hands. In France most public buildings are decorated by the painter, and none of the technical troubles complained of here were apparent. The author asked the attention of the Institute particularly to his suggestion for the promotion of a school of decoration, not with the object of competing with existing schools, but of supplementing them. His idea was that it should be a school common to the architect, the sculptor, painter, glass designer, and wood carver, for the use not only of the advanced student, but equally for the full-fledged craftsmen in the various arts who desire a special training in the arts of decoration. Professors there would be representing all the branches concerned to lecture and to teach; studios furnished with reduced models or studies of pictorial decorations in their settings; applied sculpture, glass, woodwork, etc.; all conceivable facts, measurements, scale, proportions—anything and everything for the use of the student that could be collected, carefully tabulated, and arranged. The creation of travelling studentships, enabling students to travel in pairs—an architect with a painter, an architect with a sculptor, and so on—with provision to make reduced copies of fine examples of art in their settings, the results going to enrich the school collection, so that by degrees these models might replace the photographs or other less useful authorities. The author went on to prove the necessity of such an institution, and the possible advantages that would accrue from its establishment. In these days of innumerable styles of architecture a wider range of architectural knowledge and of cognate decorations is imperative. Most decorative pictures are built upon architectural lines, and more often than not architectural features are abundantly introduced. At the school proposed the architect student would work in the company of sculptors and painters. Each would learn to sympathise with the aims of the others, and so in later life be prepared to work, as they should, into each other's hands. A decorative school, to which almost every painter and sculptor should go for at least a year after his usual training was completed, would react most beneficially on the general art of the country.

Sir Aston Webb, in proposing a vote of thanks to the readers of the papers, said he did so with great diffidence. They had all enjoyed a most enchanting evening, and the only mistake he could find was that the papers were too short. He was afraid it would be laid to the door of architects that they had not given the opportunity for decorative painting which had lain in their way. If that were so, it had been shown that night that there was a desire to alter it. On the other hand, he thought all would admit that in England, in this damp climate, there had been great difficulties in the employment of decorative painting. Sir Wm. Richmond, whose knowledge in this particular branch was as large as anybody's, had given suggestions as to the execution of decorative painting which he thought would be invaluable to them. He understood from Sir Wm. Richmond that there was a tempera which could be used in England with certain results. He had told them that damp was a great difficulty, and they all knew that for nine months of the year at any rate damp was always with them. He remembered the case of the chancel arch of St. James the Less, Westminster, which was not an outside wall. The wall of the arch was decorated by Watts with a great subject, and within twenty years it was invisible, and had to be replaced by a mosaic. He had not the technical knowledge to know with what media that was painted, but when failures of that sort occurred, of course, it made not only the architect, but also that indispensable mortal the employer, hesitate a little before adopting such methods for the decoration of a building. Sir Wm. Richmond had referred to the increasing alliance between the arts of painting, sculpture, and architecture, and he might say it was the desire of architects to work more and more with painters and sculptors. He did not think architects were the assertive persons some would have them believe, for there was nothing they would like better than to have their walls decorated by painters of ability, and he believed they all felt that if they were to obtain the co-operation and help of painters of to-day to decorate their architecture they must see that their architecture also bore the imprint of to-day; they must impart into their architecture some modern feeling which would inspire the painter with a modern feeling for the decoration. To go back to strictly traditional Gothic, and expect their modern painters to fill in their spaces with strictly mediæval figures, was more than they could expect. Hogarth had been called the father of English painting, and they knew that in gratitude for the good he received at St. Bartholomew's Hospital he painted the great wall of the staircase, which remained to the present time. He thought they would all regret if the necessary enlargement of the hospital should necessitate in any way the removal of those paintings. Many of them would also know that in Dean-street, Soho, and other streets, in very poor houses, they could find the whole of the staircase walls painted from top to bottom by English painters of about the same time. He was not quite sure that the painters of the present day were quite so ready and willing to paint staircases as they were. Very likely that was the architect's fault, and if so he was sure they would be prepared to try and alter it. There was a magnificent opportunity awaiting decorative painters now in the great Roman Catholic Cathedral at Westminster, where the architect had entirely subjugated himself to painting, and had left large vaults and arches without a single architectural moulding. They looked with a little anxiety and with great hope and interest to the way in which the painters of this country were going to finish that building inside. Sir Wm. Richmond referred to a matter which very much touched the architect's work, and that was the matter of joints. He believed Sir William was speaking of mosaics, and of the desirability for showing the joints. That was a thing which they, as architects, were much moved to, both in brickwork and stonework. When they put up a thing properly, and showed the joints, the work was greatly improved. The old brickwork of Hampton Court Palace was 1½ in. and 2 in. bricks, and the joints were an inch wide, and the effect of such work was to give a texture to it without waiting for age. Another point mentioned by Sir Wm. Richmond was one which must appeal to all painters, viz., the advantage of decorative painting over easel painting, in that it was suited for the position, which could not be changed, and that the light in which it was painted would be the light in which it would always be seen. They all knew the great difference there was in a picture as seen in the studio and when seen in a room. That was often laid to the fault of the architect in designing rooms not suitable for pictures, but he ventured to suggest that perhaps the studio was not suitable for a dining-room, and that therefore the picture was painted under somewhat false conditions. People would not dine or sleep with a top light. One other point which had been brought out of recent years was, of course, the extraordinary liking for white. He had heard it referred to as the leprosy of whiteness which had spread through their houses and a great number of buildings. Well, it saved a great deal of trouble. One painted the whole thing white and had done with it. But that was not what they called decorative painting, and they did look to the painters to help them decorate their buildings in some more architectural manner than by merely painting them white. Mr. East had given them, as they expected, a very admirable paper, which was far too short, on the advantage of landscape for the decoration of buildings. He did not think it required any pleading at all. Sober landscape, such as Mr. East himself painted, in long panels, he imagined, would look extremely fine on the wall of that room, and he wished Mr. East would give them one just to show how it could be done. In sculpture, too, trees had certainly been largely employed. Mr. Frampton and others were very fond of providing their subjects with stems and leaves on the top, and he could assure Mr. East that there was nothing against trees, so far as architects were concerned. Mr. Solomon had also given them a suggestive paper, and his principal point was that they should have schools for decorative

painting. That, of course, they must all agree with. He might take it that one difficulty of decorative painting was that painters as a rule —and they admired them for it—liked to do their own work. It was their laudable pride that the work had been done by their own hand and by no one else's. When they came to great buildings, and domes and arches and great wall spaces, it always seemed to him that that was an idea of perfection which could not be carried out, and that the help of others must come in. He felt that it would be the highest point of the great painter to train others by getting them to assist him in carrying out a great work which he had designed. Decorative painting, he took it, was to decorate, and the great thing was the design, and when that design was settled in scale and in colour it would be only proper, and, in fact, absolutely essential, that others should be called in to help them do it. All the great Italian painters did that. He might mention the case of Verrio, who started to paint the big painting at Christ's Hospital, but gave it up when half through, and left it to young men to complete it very badly. If he had bestowed his time on the design, and given it to others to work out, the result would have been a great deal better. He did not understand whether Mr. Solomon suggested a new school, for there were the very solid foundations of two excellent schools in which the work he proposed could be carried on. There were the schools of the Royal Academy, where students in painting, sculpture, and architecture worked side by side, and the Academy did endeavour to encourage this by giving the students from time to time a commission to paint on the walls of the Academy premises some of the prize designs which were won by students. If that could be carried further it seemed to him they would have there a very good commencement, at any rate. There was already a wish for architects and sculptors to work closely together, and that seemed another way in which Mr. Solomon's idea might be arrived at. Then there was the Royal College of Art at South Kensington, which for years had been working on these lines, and in Stevens's time produced a great deal of excellent work, and was also in these times producing excellent work. He felt that both of these schools only wanted the recognition and encouragement of the public to do what Mr. Solomon proposed. In a very small way he himself had had the help of the students at the College of Art to paint a ceiling, which they did exceedingly well, and which they enjoyed doing very much, and he had now the help of some of the sculptors to carve some of the figures on one of his buildings. It was an enormous encouragement to them. They entered into it with great enthusiasm, and it would be a pleasure for any architect to employ these young men to work on their buildings.

Professor Beresford Pite, in seconding the motion, said they were also indebted to Sir Aston Webb for mentioning the fact that at the Royal College of Art there was in existence practically the system which Mr. Solomon desired, and he hoped that Mr. Solomon would pay them a visit. If he did he would discover not only that the students of architecture, design, modelling, and painting worked together and were associated with one another in each of the four schools, but they happily also had two travelling scholarships. One was for three months and the other for six weeks, and Mr. Solomon would be much encouraged to know that by the goodness of a paternal government every year sculptors and architects and painters travelled together. He hoped the day would come when these artists would work hand-in-hand, and when those present would have the privilege of employing them. Mr. East would have to convert the sculptors before he converted the bricklayers and the stonemasons to landscape as a means of decoration. What did they mean by decorative painting? Was there not a lurking idea that decorative painting was painting without atmosphere and painting without perspective? That idea would have to be dispelled if landscape was to become a means of decoration. If this solemn and beautiful and altogether modern art which took the mind of nature with her mists and distances and lights, and translated them so delightfully as to become a continual reality, had to sacrifice these methods of nature, and if they had to take the atmosphere and the perspective away to enable it to take its place between pilasters and solid mouldings, it would have to cease to be landscape art. It would become Japanese pattern design, and as such very beautiful and very helpful. Landscape would have to pass through the crucible of the sculptor before it could come down to the level of mere practical building art. But was not decorative painting, after all, the painting that was merely suited to its position? No definition as to the absence of perspective or the difficulties of atmosphere was needed, provided that the decoration was suited to the position. He confessed that he heartily sympathised with Sir Wm. Richmond's criticism, that where atmosphere was represented on a wall the sense of solidity necessary to that wall vanished, and the mind could not conceive distance in the panel and, at the same time, structural support. They were unfortunately compelled by custom to admit distance and perspective into the panel, but that unfortunate recognition revealed the fact that they had unhappily lost the real sense of building, the real sense to enjoy the value of the wall, the real feeling of enclosure and support, which was the basis of architectural art. Until they got through the stucco and wall papers, and felt the bones within their building, they could not derive genuine architectural satisfaction from the design of its structure or the structure of its design. The matter brought before them that night was most important, and he was much obliged to the Council for making it the subject of discussion. He ventured to think that no subject was more important. They had had during the century that was passed some of the greatest features of English history. They had with them now artists who were second to none, and during the same period they had had architects who had raised hopes within their breasts that, after all, England was not a second-rate country in architectural matters. Their ecclesiastical and domestic art could challenge comparison with the art in any country in the world, and this was recognised, one was glad to know, by Continental nations. But unfortunately the great painter and the great architect had not been yet fused into the architect—and he must in this connection use the term architect—who could decorate. That man had not yet come, and why was it? Probably the fault lay in education. He felt that before they could get the combination necessary to remedy the fault they must recognise the fact that no architect could by mere artistic friendship with a painter succeed in inducing within the painter the architectural sense, and conversely the painter could not infect the architect by a friendship or sense of sympathy or by a mere expression of harmony of ideas from his standpoint. A school of decorative architects had to be framed from the roots upwards. If architects would recognise that they were living in an age which demanded great buildings, and that what was needed was a great architect to decorate the great buildings, they would see that there was something besides construction, essential although that was; something besides antiquarian squabble of the style, important although that was; something besides professional politics, which was eating into the vitals of the Institute, and destroying their ideals of true art; something more essential to architectural art than they had yet laid hold of. The subject which they were dealing with that night was brought before them once in a way. They had the pleasure of discussing such papers as they had that night, and then for the next few months they resumed their professional political squabbles. In the early part of next session they would discuss education, and then go back to squabbles; and then they would perhaps have a President who would suggest a paper on mosaics, and then they would go back to squabbles. If they recognised that they lived in an age which demanded great decorative buildings, and a school of architects to undertake the building of these, they would take the first step towards showing that there was scope for education in this matter, and that the mere sentiments which had been so eloquently expressed by Sir William Richmond represented a real need, and that it was their duty as architects to recognise that they had neglected decoration; that they had been concerning themselves with matters far below the architect's scope and the architect's ideal, and that there was here a field for the proper decoration of public buildings, a field to enter into and take possession of, and supply a great public need. It was not the question of calling in a great painter to decorate a great building. They had to go behind the sculptor, and to realise the first principles of architectural form; they had to take colour, and discuss its value and placing, and its relation to the ornament with which they laced it down and tied it to the building; they had to grow from the form through the increasing value of material such as marble and bronze to the pure colour in all its fulness and richness on which they laid the fine ornament of the goldsmith or the fine ornament of the lace-maker, and pass from that into a sphere where figure decoration became apposite; and possibly in that sphere might come the atmosphere and higher qualities of decorative art. All that lay before them. Happily they now had students taking up the subject of decoration. Possibly there was no one present with any higher ideal than the idea of just feeling the responsibility of recognising the fact that there was such a thing as colour decoration. Might they, then, that night take a vow to forswear professional politics and seek the good of architecture, and advance the art of architecture which lay open to them in this great field.

Mr. H. Heathcote Statham, in supporting the vote of thanks, said he should like to say how much he admired the practical character of Sir William Richmond's paper. They could always have plenty of theory, but Sir William Richmond, in his paper, had given them the practical experience of an artist who had been working in those different materials and studying them, and really telling them how the work could be done. He was also very gratified at hearing Sir William's remarks about mosaic, which he (the speaker) had always thought was so peculiarly a form of architectural decoration, because it was a built-up picture, a kind of architecture on a small scale. He ventured to suggest whether, in talking of decorative art, and especially decorative painting, painters and writers on art were not often making a confusion by using the word "decorative" in two different senses. The very first time he had the pleasure of meeting Mr. East he remembered his remarking that landscape painters were just as particular about their lines as architects were. He (the speaker) replied that he had never had the slightest doubt of it. Every picture, whether a landscape or figure picture, had to be decorative in line; if not, it had no *raison d'être* as a picture. But then, surely, there was a second sense in which the word "decorative" was used—that of the painting or piece of sculpture which was in some way subordinate to the architectural lines, and which gave up a little of its own individuality. There was a remarkable passage in the "Life of Burne-Jones" in which someone, in reference to his picture of the three Queens weeping over Arthur, wanted to know why he did not give them a little more individual character: the faces were all the same. And he said: "Well, if I had made them individual characters, what would they have been? They would have been Augusta, Esmeralda, and Dolores, considerably overcome by a recent domestic bereavement." Burne-Jones wanted to keep them above that, on a perfectly ideal plane. It might be said that Burne-Jones carried that a little too far; but that was an illustration of the fact that when they had to use art, simply regarded as a decoration for architecture, it had to give up some little of its individual life. Coming from that he should like to remark upon what Sir William Richmond said—that it was such an important element in decorative painting that it should be executed in the midst of its surroundings. It was a very remarkable thing that the French, who had done more decorative painting than any other nation, had lately given that up; they had found it much easier to paint an immense picture in the studio and then fix the canvas on the walls afterwards. He could not help thinking, in going through the French *salons*, and seeing some of these enormous and rather coarse pictures, how much they had lost through being painted away from the site; that they were not in harmony with it; they were so self-assertive, as one might say. When they came to consider the question what decorative art meant, and how far landscape could really be decorative, it appeared to him that landscape essentially meant distance. It meant successive phases of distance. Professor Pite anticipated him in saying this, but he quite agreed with his remark; everything that people called decorative landscape (he had seen a great many of them in the French exhibitions) came down to this, that they were quiet, rather flat landscapes, with not a very great effect of distance and no

very great disturbance in the atmosphere. He thought decorative landscape of that kind could have a very fine effect combined with architecture, but he did not think it touched the highest point of landscape art in itself. In fact, surely the easel picture had a claim to be regarded as a separate thing. One might paint a landscape which was a little flat and rather subordinate in order to form part of a decorative scheme; and then one had an easel picture landscape, like most of Turner's, which was put in a frame so as to be divided from other things, and so looked into as an individual work in itself, apart from its surroundings. Both sculpture and painting had a right to that individual life. In sculpture, again, look at the front of Wells Cathedral. The lower sculptures, those straight up-and-down figures in the niches, were purely decorative sculpture; they had very little expression; they seemed to be part of the architecture. When they came to the Resurrection series at the top there was far more movement and vigour; but that was all half-size; and he was not certain that it was not partly an instinctive feeling on the part of the architect that life-size figures of that kind would have destroyed the repose of the building. Mercié's fine group called "Gloria Victis," in one of the courtyards of the Hôtel de Ville, Paris, was a magnificent piece of sculpture which had its own story, its own action, and its own line. It was far too vigorous to be associated directly with the building; it was surrounded by an architectural court; and each of the two added to the effect of the other. But he mentioned that as an instance of the power of sculpture to stand alone, and the fact that it really must stand alone if it was to be treated with all the vigour and lifelike expression of which it was capable. One word about ceiling paintings, which had been referred to. Wherever figures were used in a ceiling it seemed to him essential that they should, as one might say, "float." The only ceiling painting, he believed, that Puvis de Chavannes ever painted showed two rows of figures with their feet at the sides and their heads towards the middle; the effect of which was that the observer did not know which way he was standing. He would instance as the right sort of thing the ceilings that used to be painted by the late M. Marioton, which everyone who went to the French *salons* annually must have noticed. They were not always what one quite liked in colour; but they had that floating effect, not the prosaic composition of figures standing upon the ground; they had the lightness of effect which seemed to be required in a ceiling. The conclusion he wished particularly to emphasise was that there were really two kinds of art—decorative art and individual art. Nobody was more convinced of the importance of regarding decorative art as the ally of architecture than he was. They had far too little of it in England; the Government gave far too little opportunity and encouragement to it; but he would only urge that individual sculpture and easel pictures stood upon their own ground, and were not to be scoffed at because they were not in the same sense decorative art.

Mr. J. D. Crace said he was delighted to have been there to hear such an experienced artist as Sir William Richmond, who had had to confront enormous difficulties, and, having learned what they were, had shown from his experience how they were to be overcome. He believed that it was only those who had entered into the difficult arena of decorative painting who would be able to teach architects very much of what decorative painting should be. It appeared to him that they ought to begin by considering that decorative painting ought really to be painting which decorates in the sense of adorning a building. The building must from the beginning be the one thing to study. The subject of the picture, of course, was important in itself, but regarded from the decorative point of view it did not matter one bit whether the subject was a battle or a picture of saints, for the point was that it should be both in colour and form, and in the space that it fills, a painting that would really improve the building. That appeared rather to have been lost sight of in the discussions on decorative painting which he had heard in those rooms before. As regarded the use of landscape in decoration, it was not accident or ill-will that had kept it from being largely used for decoration. In fact, it was used in early examples of tapestry, and it might be said why, if it was used in tapestry, should it not be used for walls? But tapestry was not structural, and the eye did not expect support, and the only positions in which landscape could be legitimately used as decorative painting would be those positions which were obviously not intended to support. They could put a landscape into an arched recess, but to put it along a wall which obviously carried the structure at once weakened the effect of the building. In Sir William Richmond's admirable remarks upon mosaic, with which he supposed most of them would agree, there was one point he did not mention, which was that undoubtedly angles must be rounded. In all the old buildings in which mosaic was seen to advantage there were no sharp angles in the surface which was covered. As regarded wax painting, it should be remembered that where the atmosphere was impure such painting had its drawbacks, because it was impossible to keep the dirt off the painting. However hard it might appear, it always retained some of the dirt, and it was almost impossible to cleanse it. There was another thing to be borne in mind in those media of painting in which spirits of turpentine was employed. All essential oils darkened, and that was why varnish darkened. If they dipped white paper in turpentine, and put it away for a few years, they would find it became as dark as brown paper, and what happened with the paper was what happened with a painting. From the day it was painted it went on darkening, and although it was comparatively a slow process, yet a painting which was executed with a free amount of turpentine would never retain the same brilliancy as fresco, where fresco was possible.

Mr. E. W. Hudson pointed out that Mr. East had not told them that he had put his theories into practice in the unique window in stained glass in New College Chapel, N.W., London. Mr. East had there treated landscape conventionally, and he was sure if they went in the summer and watched the setting sun coming through the window they would be fascinated. If, however, they saw it in winter, and were satisfied with conventional glass windows, they might probably come away with their fancy not upset.

The Chairman said a short time ago he saw in one of the papers a paragraph headed "A new use for walls; a solid structure for the purpose of decorative treatment." He thought at once this must have been written by one of his friends the painters, but he found it was by the engineer of the new Ritz Hotel, who apologised for the wall as being necessary to keep out the weather and as being of some advantage for the internal decoration of the building. No doubt as architects they would long make use of walls for structural purposes, but it might be well to take the hint and see that their walls provided places also for pictures. They had learned something of the use of sculpture in giving expression and meaning to their buildings, and they wanted to learn also how painters could help them in decorative work. But the great point which he thought they had learnt that night was that it was essential they should all work together from the very beginning. From the very inception, the architect, painter, and sculptor should work together, and if they be united in one person so much the better. It was essential that the sculpture and painting should form an integral part of the building so that it was not complete otherwise. It was quite true that architecture had something to say, but it could say it more strongly and more eloquently if it was aided by the sculptor and the painter. He felt that with regard to the form of decoration there ought to be a place for each of the different methods of which they had heard that night. The one thing they had learned was that there should be no atmospheric effects admitted on the structural parts of the building. Piers, arches, chimney-pieces, and walls which were absolutely intended to be solid and do actual work, should be treated with a flat decoration and something which had no perspective, but he saw no reason why under large arches and in panels a greater freedom might not be allowed. Perspective in such cases might be introduced, and they knew how valuable that might be. In the Vatican there were two wonderful pictures of Raphael—the "School of Athens" and the "Dispute of the Sacrament." In the case of the "School of Athens" they had an architectural perspective carried out in the panel giving distance, and it looked like an immense addition to the room. It offered a splendid background for the figures which were thoroughly in scale with the building. In the "Dispute of the Sacrament" they had a delightful bit of perspective with landscape in the distance, but, of course, the figures were the most important. The perspective gave immense size to this otherwise rather small room. The treatment of the ceiling had always been a puzzle to him, but he did not propose to say anything about it now. As Professor Pite had said, admirable work was being done at the school at Kensington, and he hoped at the Royal Academy it would be possible to allow the students to mix more freely than they had done, for there were many things which painters, architects, and sculptors should work out together.

The vote of thanks was heartily carried, and Sir Wm. Richmond briefly replied.

Mr. East, in reply, said that perspective had been indulged in by every painter in the past, and yet it was objected to in landscape. He said there were two aspects of landscape—one easel and the other decorative, and he presumed that in the education of students the treatment of landscape would be purely and severely decorative. From that point of view it could be treated, and it had the advantage that it did not abstract one by the assertion of incident or anecdote. He felt that they all wished for the union of their arts, and they all ought to work together for the accomplishment of one great aim.

Mr. Solomon said he had no idea that the system at South Kensington was so complete, and his idea was not to compete with existing schools, but to supplement them. The student came from the school and did not know what to do next, and if he had a year at decorative art it would put him on his feet.

The Chairman announced that the next meeting would be held on April 3, when papers on "The Planning of Cities and Public Spaces" would be read by Professor Beresford Pite and Mr. J. W. Simpson.

AN ELECTRICAL EXHIBITION.

A USEFUL exhibition has been organised by the County of London Electric Supply Company in order to show their consumers and residents in their areas of supply the latest developments in connexion with electrical lighting and heating. The exhibition is being held at 118-122, Holborn, E.C., and it is well worth visiting by all interested in the applications of electricity. The special feature of the exhibition is the very extensive use that is made of motors for driving purposes. This affords trade consumers and manufacturers an opportunity of seeing how easily machinery of practically every description can be driven electrically. The exhibitors volunteer full particulars about actual running costs and depreciation, and the Electric Company also give intending consumers full information regarding the running costs of the motors actually at work on their circuits. We are glad to note that the company only charge 2½d. per unit for power and heating, and in special cases they allow very considerable discounts on the meter bill. For basement lighting they make a specially low charge of 3d. per unit.

The exhibition is divided into two sections, the first of which, on the ground floor, shows exhibits of lighting, heating, and electrical accessories. The second section is mainly in the basement, and shows the application of electricity as a motive power.

The Electrical Company, of Charing Cross-road, show the Luna Flame Arc Lamp. In this lamp the carbons are inclined to one another at an acute angle, and the light efficiency is very high. The Nernst lamps, for which they are the agents, will also interest consumers. We were specially struck with their "waterproof" motor, which ought to prove useful for crane work.

The photometer bench made by A. Wright & Co., of Westminster, with a Simmance Abady flicker screen will interest central-station engineers. This device certainly simplifies photometric work.

The Westinghouse Company exhibit the new Cooper Hewitt mercury vapour lamps, and their other exhibits are of great technical interest.

Messrs. Maple & Co. exhibit an "electric" tablecloth. A lamp standard, having two needle contact makers on its base, lights up at once when placed anywhere on the cloth. There are many other novelties shown by the leading electrical manufacturers.

We can heartily congratulate the County Company on their enterprise, and the exhibition deserves to be a success.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A YORKSHIRE district meeting of the members of the Association of Municipal and County Engineers was held at Cleckheaton on Saturday, March 18. The members assembled at the Town Hall, where they were received and welcomed by Mr. Councillor Field, J.P., Chairman of the District Council. Mr. A. T. Davis, C.E., County Surveyor of Shropshire, President, occupied the chair, and among those present were Messrs. A. M. Fowler (Manchester), J. P. Norrington (London), W. H. Hopkinson (Keighley), Settle (Heywood), J. Parker (Hereford), J. Mallinson (Skipton), S. G. Heywood (Brighouse), C. Lund (Cleckheaton), Wellburn (Middleton), Massie (Wakefield), E. J. Silcock (Leeds), and others.

On the proposition of Mr. Lund, Mr. W. H. Hopkinson, of Keighley, was unanimously re-elected Hon. Secretary for the Yorkshire district.

Municipal Works, Cleckheaton.

Mr. C. Lund, Surveyor to the Urban District Council, read a paper on the "Municipal Works of Cleckheaton." He said Cleckheaton, in its industrial aspect, was probably unique. Such a diversity of manufactures could hardly be found in any other English town of similar importance. Cleckheaton's economic prosperity was at the source of its public enterprise, and it was necessary to lay some little stress on the existence of large and thriving textile mills and of works devoted to wire-drawing, card-clothing, chemicals, leather, and engineering, in many various branches of each trade. In 1904 the population was estimated at 13,000, and the rateable value was 58,288. The area over which the Urban District Council had charge covered 1,755 acres, and ranged from 240 ft. to 560 ft. above ordnance datum. More than 14 miles of roads and streets traversed the district, certain lengths being subject to peculiarly heavy traffic. Some 6¼ miles were main roads. The County Council paid to the District Council the whole of the actual expenditure on maintenance plus 5 per cent. for establishment charges, the average annual expenditure being 336*l.* per mile. The other roads of the township were maintained at the rate of about 175*l.* per mile per annum. The materials used on the roads were Leicester granite and Low Moor dross.

The tramways of the British Electric Traction Company (heavy woollen district) connected Cleckheaton with Dewsbury, and with the intermediate townships of the Spen Valley. The town hall with municipal offices had set something of an example to those building in Cleckheaton for private purposes. It was erected at a cost of 17,000*l.*, under the supervision of Messrs. Mawson & Hudson, architects, Bradford. In addition to the large hall of 90 ft. by 35 ft. by 34 ft. high, which accommodated comfortably 1,000 people, there were a council chamber, committee-room, and anteroom on the first floor. On the ground floor were the offices of the officials of the Council, curator's rooms, and in the basement were the plumbers' workshops and stores of the gas and water departments.

The public baths were provided in 1889 at a cost of 5,000*l.*, and were erected under the joint supervision of Messrs. R. Castle and W. Howorth, architects, Cleckheaton; they ministered to a distinct want, and they were, doubtless, worth more to the community than their direct cost. The average expenditure per annum was 350*l.*, and the receipts 170*l.* A singularity about the water in use at these baths was that it was pumped from old coal workings, and, after filtration, the water in the baths was seen to be of a beautiful transparency, and blue, rather than yellow, in tone. In nature, the water was heavily charged with oxide of iron, from which it was freed by upward filtration through a layer of foundry dross and breeze from coking ovens.

The stables and fire brigade were erected in 1890 at a cost of 3,000*l.* The author had been asked to inquire into the merits of motor traction for municipal work with a view to a report being drawn up and presented to the Council at an early date. Water was arranged for by purchase in bulk from the adjacent city of Bradford. A sum of 17,000*l.*, raised to purchase distributing plant, had been wholly repaid, and in respect of its freedom from anxiety over water undertakings the town was to be congratulated. Water for domestic purposes was supplied at charges varying with the rateable value of the consumer's premises. Water for one bath and one water-closet was supplied with no extra charge. Users for trade purposes were charged 11d. per 1,000 gallons, less discount at 5 per cent. if paid within one month of demand.

Previous to 1898, when the author was appointed, 16,000*l.* had been already spent in re-sewering the district under the direction of Mr. J. C. Haller, C.E., of Dewsbury. Since then 7,800*l.* had been expended, and an application for a further sum of 1,000*l.*, now before the Local Government Board, would complete the sewers of the Cleckheaton and Scholes wards. The whole of the sewage from Cleckheaton ward was connected to the Liversedge trunk sewer, and was treated by that authority, under agreement for the sum of 900*l.* per annum. The sewage from Scholes ward was treated on about 10 acres of pasture land by broad irrigation, and that from Oakenshaw by precipitation with aluminoferric, the effluent then being passed over a bed of clinker from the destructor. The effluent from both these works was generally approved by the Rivers Board.

At the northern extremity of the burial ground a temporary iron structure had been erected as a small-pox isolation hospital. Another hospital within the Cleckheaton area had been provided and equipped at a cost exceeding 10,000*l.* to serve the united districts of Cleckheaton, Hunsworth, North Bierley, and Tong (the two latter being now part of the city of Bradford) created under the Provisional Orders Confirmation Act of the Local Government Board (1888).

Attention to public health was displayed by the provision of three recreation grounds at West End, Moor End, and Scholes, of approximately 5 acres, 8 acres, and 3 acres respectively. In addition there existed several small open spaces.

The combined electricity and destructor works were opened on November 21, 1902, and were erected under the supervision of the author. The electrical equipment being under Messrs. Gibbings & Baker, of Bradford and London. The buildings might be briefly described as being built of red brick with stone facings, the roofs of the boiler-house and engine-room had iron principals, boarded and slated with Welsh slates. The destructor installation was by Messrs. Meldrum Brothers, Limited, of Manchester, and was known as the "Simplex Regenerative System." The destructor boilers were 16 ft. long and 7 ft. in diameter; two coal-fed Lancashire boilers, 30 ft. by 8 ft., were also housed there; the accommodation provided, in addition to the engine-room, being the electrical engineer's office, meter-room, workshop, battery-room, pump-room, with the usual lavatory accommodation; the chimney was 150 ft. high and 8 ft. internal diameter.

The total number of houses approached 3,000, and the total rateable value was some 21 per cent. below that of the gross estimated rental. The death rate from zymotic diseases in the last year recorded was the low one of 0·93 per 1,000, while infantile mortality returns indicated that the percentage of deaths at age less than one year was only 11·82 of the total of registered births.

Mr. Settle (Heywood) proposed a vote of thanks to Mr. Lund for his paper.

Mr. Wellburn (Middleton), who seconded, commented upon the District Council providing public laundries and the use by residents at a charge of 4d. per hour, and asked whether that included hot water and soap. There was a tendency at present to provide almost everything for working people, and he would like to know whether this was appreciated, and whether it was done at a profit or involved a financial loss.

Mr. Massie (Wakefield) pointed out that the 5 per cent. allowed by the County Council for establishment charges in connexion with main roads involved a liability for any accidents that might occur on the roads. With regard to the purchase of water in bulk from Bradford they might be told at what price per 1,000 gallons it was supplied to Cleckheaton, and whether it could be distributed at a profit, considering the moderate water rental.

Mr. W. H. Hopkinson (Keighley) asked whether the water from the old colliery workings used for the baths could be pumped cheaper than it could be purchased from Bradford.

Mr. A. M. Fowler (Manchester) said the question of trade effluents was a very important one, affecting the trade of the country. In Manchester something like 36,000,000 gallons of effluent water flowed daily into the Ship Canal, and Mr. Gilbert Fowler, the analyst and chemist, recently told him that the effluent they were now producing was fully up to the standard of the Irwell and Mersey Rivers Committee. If that was so, the effluent was practically as pure as some of the Thames water supplies, and some supplies in other parts of the country. Some thirty years ago he brought forward the question of supplying mill owners with water for trade purposes from the effluent water of sewage works. He had gone into the question of supplying this water to mill owners for condensing and manufacturing purposes, and he found it could be distributed at a cost of something like 2½d. per 1,000 gallons. If the effluent water was utilised, the mill owners would be helped by obtaining their water supply for trade purposes at a cheaper rate, and the demands upon the town supply for domestic purposes would be supplied. Manchester was near to a water famine until they got the third pipe line laid from Thirlmere to Manchester, yet the city authorities were selling the water to manufacturers for trade purposes while the public were almost starving for it. He urged municipal engineers to look into this question of the utilisation of the effluent waters, seeing what a great benefit it would be to mill owners to have a cheap supply for trade purposes.

The President thought the County Council of the West Riding of Yorkshire was acting very generously with the District Councils in allowing the whole cost of the maintenance of main roads. He was one of those who believed that the word "towards" meant something not quite the whole.

Mr. Lund, in replying to the discussion, stated that the charge of 4d. per hour for the laundry included hot water, soap, and the use of washing, wringing, and mechanical drying machines. The privilege was not appreciated to any great extent by the public. The cost of pumping the water from the swimming bath was 9s. for 50,000 gallons. They paid the Bradford Corporation 9d. per 1,000 gallons for the water supplied in bulk, and made a small profit on its distribution. They admitted trade effluents to the sewers, but required the manufacturers to keep back the solid matter. The manufacturers were very good in keeping back the solids by means of settling tanks, and they had nothing to complain of in that respect.

The Destructor Works.

Mr. Pickersgill then read a paper on "Cleckheaton Electricity and Destructor Works. In describing the destructor, he said:

"The destructor is of the well-known Meldrum regenerative type, and consists of two units each having its own combustion chamber regenerator and Lancashire boiler. Each unit has two grates, each of which has an area of 25 sq. ft. or 50 ft. in each unit. The capacity of each unit is 20 tons in twenty-four hours; this is equal to burning 37 lb. per sq. ft. of grate per hour. The front feed method of firing has been adopted, the refuse is tipped into bunkers opposite each unit and is then thrown into the furnaces by hand, the clinkering is also done from the front, and so far the results have been satisfactory. The author is of the opinion that to further describe this portion of the undertaking would be useless, as most if not all the gentlemen present are fully conversant with this type of destructor. There is, however, a subject appertaining to this department which, when worked in conjunction with an electricity works, occasionally gives rise to considerable friction between the two departments in many towns. The author refers to the amount which should be paid for steam supplied to the electricity department from the destructor. There are several methods which have been adopted, but none seem to have given satisfaction. The author has, however, propounded a scheme which seems fair to both departments, and has been adopted by this Council as a basis for the conjoined working.

The arrangement is as follows:—The total wages paid for stoking is ascertained, and of this a sum of 218*l.* 8s. is debited against the electricity department as its proper share for stoking the coal fired boilers, the remainder being debited to the destructor department as its proportion for burning the refuse. The total cost of coal per unit sold is now obtained, and credit is given for steam supplied, so that the total cost per unit for coal shall equal 0·3 penny. The following example will no doubt

make the method perfectly clear. Suppose the total wages paid during the year for stoking amount to 450*l.*, of this total 218*l.* 8s. is paid by the electricity department as its share for the stoking of the coal fired boilers, the remaining 231*l.* 12s. being paid by the destructor department for burning refuse. Now assume that the total number of units sold are 480,000, and that the amount paid for coal is 400*l.*, this would amount to 0·2 penny per unit sold; you now credit the destructor department with such a sum as will bring the total costs for coal to 0·3 penny per unit sold, the amount in this example being 200*l.*, thus leaving the net labour costs of destroying the refuse at 31*l.* 12s.

This method, the author thinks, is most equitable, he having taken several tests in order to find out what it cost in coal per unit sold when the destructors were shut down. It should never be overlooked by the members of any council, that the primary object in erecting a destructor is the proper and efficient destruction of the town's refuse, and that this should be carried out independently of any by-product or income from such undertaking. At the same time full value should be paid by any other department for steam or power which is supplied therefrom, and the method devised by the author seems to him to be a step in the right direction so far as a conjoined electricity and destructor works are concerned."

On the proposition of Mr. J. Parker (Hereford), seconded by Mr. E. J. Silcock (Leeds), a hearty vote of thanks was accorded to Mr. Pickersgill.

The members were then entertained to luncheon at the George Hotel, and the afternoon was occupied with visits to the fire station, North Bierley Joint Hospital, the new cemétery, baths, gas works, and the combined electric and destructor works.

CARPENTERS' HALL LECTURES:
ST. LOUIS EXHIBITION.

THE fifth of the present series of lectures on matters connected with building was delivered at Carpenters' Hall, London-wall, on Thursday last week, when Mr. H. Phillips Fletcher delivered his lecture on "The St. Louis Exhibition, 1904."

The Right Hon. Viscount Dillon, F.S.A., presided, and, in introducing the lecturer, referred to the remarkable growth and development of St. Louis during the past one hundred years and to the purchase of the Louisiana territory from Napoléon in 1803.

Speaking of the engineering features of the Exhibition, he said that a large amount of engineering work had to be executed before the site was ready for the buildings. Hills had to be lowered and valleys graded, and an artificial lake had to be drained and piled over; while a river had to be boxed in a "flume" 45 ft. wide by 15 ft. deep. The roads were covered with burnt ballast, gravel, macadam, asphalt, and brick. A total area of 5,800,000 sq. ft. was paved, and, taking this at an average of 25 ft. for the width of the roads, the total length of these works out at about fifty-five miles. All the kerbing throughout was of oak, 10 in. by 3 in. in thickness. The cascades and lagoons were built of timber, the central cascade being designed for a flow of 55,000 gallons per minute. The main exhibit buildings, of long leaf yellow pine, were mostly on spread footings, timber cribbing, or pile foundations, and the main walls were constructed of a double framing of timber posts, heads, cills, struts, and studding to a thickness of 2 ft. The columns and other features were also of a timber framework to the approximate shape required. Expanded steel sheets were nailed upon the wood, and fibrous plaster, known as "staff" in the States, was then applied. The timber roof trusses were mostly of the Howe type, the largest span being 105 ft., and were supported by timber columns. Many of these were composed of three posts with two sets of packing pieces between, all of which were bolted together and further strengthened with rows of white oak keys. These keys were circular, 2 in. in diameter, and were driven into holes bored after the timbers had been bolted together. After the keys had been driven home the bolts were tightened up. The English method of using a pair of wedges, thus forming a square key, was preferable, because they could be always tightened up; whereas the circular keys could not be tightened, and in some cases they fell out and damaged the exhibits beneath. However, the adoption of the circular keys was perhaps justified, since there was a great saving in expense; uniformity was insured by boring the holes with augers worked by compressed air. The lighting of all the main exhibit buildings was chiefly effected by means of skylights, clearstories, or lanterns. The Festival Hall was circular, being 195 ft. in diameter, with a large rectangular annex containing the stage, organ, accessory dressing-rooms, and offices. There was a large auditorium, covered by a dome 90 ft. in diameter, and a promenade was provided. There were also a gallery and a promenade constructed above that on the ground floor level, and tiers of boxes were constructed in the piers. Altogether seating accommodation was provided for 3,500 people. Externally this building was very ornate, as was no doubt fitting for the focal point of the Exhibition. The engaged Ionic columns of the circular colonnade were some 43 ft. in height, and rested on a podium 16 ft. in height. These columns were well modelled and were surmounted by an entablature and parapet decorated with vases. The dome, which was the crowning feature, rested upon a drum 140 ft. in diameter and two stories in height. The upper story was pierced with *œils-de-bœuf*, which were very effective when viewed from a distance. The deeply recessed northern entrance, with its crowning group of statuary, was imposing, although it was not visible from most positions, owing to the statue of Liberty at the head of the central cascade being placed immediately in front of it. The Colonnade of States was an ornamental screen 52 ft. in height and one quarter of a mile in length, which formed a background to statues symbolical of the twelve States and two Territories included in the Louisiana purchase. This colonnade connected the pavilions and the Festival Hall architecturally, giving unity of feeling to the whole. The central cascade emanated from the Fountain of Liberty, immediately in front of the Festival Hall. A great statue of Liberty towered above. The two cascades in front of the restaurant pavilions were symbolical of the Atlantic and Pacific Oceans and the spaces between the cascades were laid out in gardens.

The lecturer then dealt with the main exhibit and other buildings, in the course of which he said that the architects were responsible only for the façades of the buildings, the construction being carried out by the division of works. This system of dividing the design and the erection of buildings appears at the present time to be obtaining some foothold in the States. He thought every architect of standing in the country would agree with him that the most deplorable results would ensue if this idea was to be continued. The very name "architect" implied that he was the "chief workman," and he alone should be responsible for carrying into effect the ideas that emanate from his brain. Moreover, if an architect was to be merely a sketcher on paper, he could in no sense "design in beauty" and "build in truth," because he had not the necessary technical knowledge of the materials and craftsmanship which would enable him to treat his subjects with economy and sympathy; so that not only would untruthful buildings be erected under this system, but the client's pocket would suffer. Speaking of the Louisiana Purchase Monument, he said it was situated in the Plaza of St. Louis, at its intersection with the Grand Transverse Avenue. This position was rather unfortunate, as it interrupted the view towards the Festival Hall from the northern end of the Plaza. The shaft of the monument was 125 ft. high, and was surmounted by a figure of Peace inviting the nations of the world to friendly competition at this World's Fair. At the base were groups of statuary symbolical of the Mississippi and Missouri rivers, which are the great highways utilised in the extensive lumber trade of the United States. The sculpture of the Exhibition was designed on a magnificent scale, thus setting off the vast buildings.

The Exhibition of the future would probably be organised for single and specific purposes, and not upon a large general scale. It was generally agreed by European critics that the Chicago Exhibition of 1893 was too vast an undertaking to be really satisfactory in all its details. How much more did this apply to St. Louis, which was double the size! The fatigue entailed in seeing the Exhibition was simply enormous, and the glare of the buildings rendered smoked glasses an absolute necessity. The fact was that each building alone was an Exhibition in itself.

The one prevailing idea amongst Americans of all classes was to have, or to build, the "biggest thing on earth," and to claim it whether they had it or not. If they would impart a little more thoroughness and a closer study of detail into their ideas, a more complete and harmonious creation would be the result. As examples of what was meant, he might perhaps mention that the model street was execrably paved, the hospital was placed next to the vibrating automobile shed, and at one of the entrances to the Exhibition one was almost compelled to go on all fours under a railway track to get to the turnstiles. As a further illustration, he might mention that when living at the palatial Club, at St. Louis, where swimming baths, a ballroom, and other luxuries were provided, the façade, though imposing, was so designed that the bedroom windows could not even be reached by the hand, and the floors of some of the rooms were at different levels. Some of the bathrooms were unventilated, and in one case both taps were fitted to the hot-water supply. At the Washington Hotel the steam exhaust from the laundry practically discharged into his bedroom window, and none of the plumbing pipes were of sufficient diameter for comfort.

Mr. Fletcher said he must admit that destructive criticism of a vast undertaking like this was superlatively easy, and he was much impressed by the fact that every day earnest people could be seen taking notes of machinery and goods that would be useful to them in their business. He admired immensely the pluck, the genius, and the overwhelming energy that were bestowed on the Exhibition, and many thousands of people were enabled to gain the most useful knowledge through its instrumentality.

A vote of thanks to the lecturer and to the Chairman brought the proceedings to a close.

THE SOCIETY OF ARTS AND THE LONDON INSTITUTION.

IN reference to the subject of the proposed amalgamation of the Society of Arts and the London Institution, mentioned in our last issue, a word or two on the history of the two Institutions concerned, and of their respective habitations, may be of interest.

The Society of Arts was first established in March, 1754, at Rawthmell's coffee-house in Henrietta-street, Covent Garden; William Baker, the microscopist, drew up the rules; the founders were William Shipley, teacher of drawing; Viscount Folkestone, first President; Lord Romney, second President, and father-in-law of Viscount Folkestone; and Dr. Maddox, Bishop of Worcester. Removing in turn to Crane-court, Fleet-street, over a circulating library; Peele's coffee-house, at the corner (east) of Fleet-street and Fetter-lane; Craig's-court, Charing Cross (1755); Castle-court, Strand, opposite Coutts's (old) bank (1756); and the Strand, opposite Beaufort-buildings, now Savoy-court, the members migrated in 1774 to the house built for them in John-street, Adelphi, by Robert Adam. In 1777-83 James Barry, R.A., painted the six pictures for the council chamber, into one of which he introduced portraits of Shipley, Mrs. Montagu, Soame Jenyns, the Prince of Wales, the Duchesses of Rutland and Devonshire, Edmund Burke, Dr. Johnson, and others, and in that room his remains lay in state (1806). The Society owns full-length portraits of Lord Folkestone, by Gainsborough, and Lord Romney, by Sir Joshua Reynolds, and one of Barry. In 1843 the Prince Consort was elected President of the Society.

The London Institution, established in 1805-6 by a proprietary body for "the advancement of literature and the diffusion of useful knowledge," and incorporated in 1807, had its first home in what had been Sir Robert Clayton's house *temp.* Charles II., No. 8, Old Jewry, where Porson lived as librarian. In 1812 the library and offices were removed to King's Arms-yard, Coleman-street. Seven years afterwards the Institution migrated to the premises which Cubitt had built for it in the then Moorfields, opposite old Bethlehem Hospital, at a cost of 31,142*l.*, after plans and designs by William Brooks. Alderman Birch, Lord Mayor, laid the first stone on November 4, 1815. Behind the library, which is 97 ft. by 42 ft. and 28 ft. high, is the theatre or lecture-room, having a capacity for 700 persons. Adjoining are the apparatus-room and laboratory; a view of the latter, designed by W. H. Pepys, F.R.S., is given in Parkes's "Chemical Catechism," 12th edition, 1826. The collection of books,

begun with a portion of the library of the first Marquis of Lansdowne, is uncommonly rich in English antiquities and examples of early printing. William Upcott, who in 1808 succeeded Porson as librarian, gathered the large collection of topographical works; a later librarian was Richard Thomson, author of the valuable compilation "The Chronicles of London Bridge," published in 1827.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday last at the offices, Victoria Embankment.

Brook Hospital.—The Finance Committee recommended, and it was agreed, to apply to the Local Government Board for sanction to incur an expenditure of 7,720*l.* on the installation of a "Economiser" plant at this hospital.

Millfield.—The Works Committee reported having instructed Messrs. Rowland Plumbe & Harvey to prepare sketches and an estimate of the cost of the suggested alterations at this home. The action of the Committee was endorsed.

Eastern Hospital.—A plan of the proposed new boiler-house, destructor, and chimney shaft at this institution was submitted by the Hospitals Committee, and approved of by the Board. The work is estimated to cost 4,100*l.*, and the Works Committee were instructed to take steps for the execution of the work.

THE INSTITUTE OF BUILDERS.

THE twenty-first annual general meeting of the Institute of Builders was held at the Registered Offices of the Institute, 31 and 32, Bedford-street, Strand, W.C., on Wednesday, when the report of the Council was received and adopted. From the report we take the following paragraphs:—

The City of London Corporation new by-laws, *re* Demolition of Buildings, referred to in the last Annual Report, have been approved by the Local Government Board. The united action of the R.I.B.A. and this Institute was successful in effecting some modifications in the original draft.

Representations having been made to your Council with reference to the erratic demands for payment made by public bodies for "Extraordinary Traffic on Roads," the question was taken up and your Council invited the co-operation of the Royal Institute of British Architects, the National Federation of Master Builders, the Surveyors' Institution, and other cognate bodies.

In consequence of a recent law-suit, your Council thought it desirable to suggest to the National Federation of Master Builders and to the Royal Institute of British Architects (co-signatories to the agreed Form of Building Contract) the desirability of amending the wording of Clause 12A in the Form where the Quantities are made part of the Contract. The suggestion of your Council has been referred by the former body to a Committee for consideration and report, and the latter body has the matter under view.

The audited accounts and balance-sheets of the Institute general and benevolent funds for the year ending December 31, 1904, were then adopted.

The following officers were elected for the ensuing year:—As President, Mr. Benjamin J. Greenwood; as Vice-Presidents, Mr. Woodman Hill and Mr. Jas. Carmichael; as Hon. Treasurer, Col. Stanley G. Bird, C.B.; as Hon. Auditor, Mr. F. Maitland May.

The following five members were elected to serve on the Executive Council, *i.e.*, Messrs. G. Kett, J.P. (Cambridge), F. Higgs (London), W. Sapcote (Birmingham), F. G. Minter (London), and C. E. Skinner (Chatham).

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 1,542*l.* for improvements and 4,100*l.* for erecting working-class dwellings at Grove-vale, and Lambeth Borough Council 1,483*l.* for paving works. Sanction was also given to the following loans:—Deptford Borough Council, 4,300*l.* for the construction of a footbridge and for street improvements; Hackney Borough Council, 3,365*l.* for street lighting purposes; Hammersmith Borough Council, 200*l.* for an advance under the Small Dwellings Acquisition Act, 1899; and Islington Borough Council 18,575*l.* for paving works.

Non-Provided Schools: Structural Condition.—On the recommendation of the Education Committee, the following recommendations were agreed to:—

"That a statement of the facts with reference to the condition of the St. Mary's (R.C.) School, Gate-street, Lincoln's-inn-fields (Holborn), be communicated to the managers of the school; and that they be informed that, in the opinion of the Council, the premises are unsuitable, from the point of view of structure, for the purpose of elementary education, and are absolutely dangerous in case of fire or panic.

That a statement of the facts with reference to the condition of the St. Mary's (R.C.) School, Gate-street, Lincoln's-inn-fields (Holborn), be communicated to the Board of Education, and that they be informed that the Council is unable to regard the school building as providing suitable accommodation beyond April 30, 1905.

That, in pursuance of sec. 7 (1) (*d*) of the Education Act, 1902, and the Education (London) Act, 1903, the managers of the Northbrook (N.) School, Hedgley-street, Lee, be required to make . . . alterations and improvements in the premises at the earliest possible date."

Erection of Buildings between No. 108, *Kensington High-street and Holland-walk.*—The Building Act Committee recommended as follows with reference to the line of frontage proposed to be adopted for new buildings to be erected by Sir Walter Phillimore, Bart., between No. 108, Kensington High-street and Holland-walk:—

"That the Council of the Royal Borough of Kensington be informed that the Council would be prepared to favourably consider an application by Sir Walter Phillimore, Bart., for the consent of the Council under the London Building Act, 1894, to the erection of buildings between No. 108, Kensington High-street and Holland-walk, to the line shown on the plan accompanying the letter from the town clerk of Kensington, dated January 13, 1905, as modified by a line drawn from a point 3 ft. in advance of the western angle of No. 114, Kensington High-street, to the western angle of the free library, subject to the conditions agreed upon between the Council of the Royal Borough of Kensington and Messrs. Chesterton & Sons on behalf of Sir Walter Phillimore, as set out in the letter from the town clerk dated January 13, 1905, being complied with."

The scheme is, approximately, to erect a long row of shops 9 ft. in advance of the present building line, and as a *quid pro quo* the freeholder agrees to surrender to the public way the strip of land in advance of the proposed new building line, having a width varying from 13 ft. to 16 ft. The scheme involves the whole block of buildings between 108, Kensington High-street and Holland-walk.

Mr. Dickinson moved, and Mr. Shepheard seconded, an amendment declaring that the Council was unwilling to allow any part of these buildings to be brought beyond the present building line.

Sir M. Beachcroft said that, if this recommendation was sent back, freeholders would know that there was no compromise in this matter of the variation of the building line, and thereby the improvement of London would be retarded for many years.

Mr. Taylor said that, in exchange for permission to build over 12,000 sq. ft. of land, Sir Walter Phillimore was proposing to give up 30,000 sq. ft. for the public use free of all cost.

The amendment was carried on a show of hands.

The proposal was consequently rejected.

Mountsfield Park: Extension and Completion of Laying Out.—The Parks and Open Spaces Committee recommended, and it was agreed:—

"That the estimate of 2,115*l.*, submitted by the Finance Committee, be approved; that expenditure not exceeding that amount be authorised for the completion of the laying out works at Mountsfield Park and its extension; that the Parks Committee be authorised to invite tenders in connexion with the works; that any necessary contracts be entered into; that the solicitor do prepare and obtain the execution of such contracts, and that the seal of the Council be affixed thereto when ready."

London Building Acts (Amendment) Bill, 1905.—The Parliamentary Committee reported as follows:—

"We report that, as the result of a compromise arrived at at the House of Commons between the members of Parliament in charge of the London Building Acts (Amendment) Bill and of the City of London (Escape from Fire) Bill and other opponents of the Council's bill, it was agreed to drop all parts of the Council's bill with the exception of Part VIII. (Means of Escape from Fire). We are satisfied that there was no possible chance of the bill passing second reading as it stood, and that therefore, as the whole of the bill would have most probably been rejected, the course taken was, in the circumstances, the best which could have been followed. It would, in our opinion, have been regrettable if, because the Council was unable to pass the whole bill this year, it had therefore declined to avail itself of the opportunity of placing before the Committee of the House its proposed amendments of the law as to means of escape from fire. As a result of the compromise, so much of the Council's bill as deals with the means of escape from fire, and the City bill, will be referred to the same Select Committee for consideration."

Captain Hemphill, Chairman of the Building Act Committee, asked that the paragraph be postponed, as the Building Act Committee wished to bring up a report on the subject and to express their regret at what had been done. This was agreed to.

Public Clocks.—Replying to a question by Mr. Horniman, Captain Hemphill said that the Committee had considered the question of insisting upon the synchronisation of all public clocks, but felt that the difficulties in the way were too great. The Committee were glad to do all they could to encourage the multiplication of synchronised clocks, and were anxious to do nothing to discourage their increase.

The Council adjourned soon after seven o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—An iron and glass shelter to the "Coliseum," St. Martin's-lane, Strand, to abut upon May's-buildings (Messrs. F. Matcham & Co. for the London Coliseum, Ltd.).—Consent.

Chelsea.†—A projecting sign at No. 15, Brompton-road, Kensington (Messrs. King & King).—Consent.

Clapham.—An additional one-story shop on forecourt of No. 49, Old Town, Clapham (Mr. H. T. Cook for Mr. H. Dunning).—Consent.

Hampstead.—That the application of Mr. A. Whitelaw for an extension of the period within which the erection of a one-story shop on the north-east side of High-road, Kilburn, southward of Brondesbury station, was required to be commenced be granted.—Agreed.

Kensington, South.—A projecting hood over the doorway of No. 39, Kensington-square, Kensington (Mr. G. D. Martin).—Consent.

Marylebone, East.—Retention of a projecting balcony at No. 6, High-street, St. Marylebone (Mr. A. Skyes for Messrs. Lilley & Skinner, Ltd.).—Consent.

St. George, Hanover-square.—A projecting sign at No. 171, New Bond-street, St. George, Hanover-square (Mr. J. D. Young for Mr. E. Collins).—Consent.

Strand.—The retention of a projecting clock at Nos. 3 to 7, Southampton-street, Strand (Mr. E. L. Lutyens for Sir George Newnes, Bart.).—Consent.

Lewisham.—Houses with bay-windows on the north side of Belmont-hill, Lee, westward of "Moray House" (Messrs. H. & G. Taylor).—Refused.

Lewisham.—A one-story addition at the side of No. 13, Queen's-gardens, Brownhill-road, Catford, to abut upon Ardgowan-road (Mr. E. J. W. Hider for Dr. D. Duncan Tindal).—Refused.

Southwark, West.—One-story shops on the forecourts of Nos. 46 and 48, Westminster Bridge-road, Southwark (Messrs. F. Taperell & Haase for Mr. P. Barnet).—Refused.

Width of Way.

Hackney, South.†—A one-story building at the rear of No. 107, High-street, Homerton, with external walls at less than the prescribed distance from the centre of the roadway of Belshaw-street (Mr. W. E. Park for Mr. G. M. Hildyard).—Consent.

Width of Way and Lines of Frontage.

Camberwell, North.—Three houses on the west side of Marlborough-road, Old Kent-road, Camberwell, southward of No. 1 (Mr. J. Whitaker).—Refused.

Kensington, South.—An enclosed covered way at No. 8, Cambridge-place, Victoria-road, Kensington (Messrs. Toten & Willett for Mr. H. D. Rowley).—Refused.

Marylebone, East.—A warehouse at Nos. 379 and 381, Euston-road, St. Marylebone, to abut also upon Cleveland-street (Mr. F. M. Elgood for Mr. J. A. Michell).—Refused.

Width of Way, Line of Frontage, and Construction.

St. Pancras, South.—Two iron gangways at the third and fourth floors and alterations to an existing gangway at the second floor of premises on the north and south sides of Beaumont-place, St. Pancras, so far as relates to the erection of enclosures and a hood to the gangway at the third floor (Messrs. Maple & Co., Ltd.).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. A. Wellings, refusing to sanction the formation or laying out of new streets for carriage traffic out of Tooting Bec-road and Upper Tooting-road, Upper Tooting, Wandsworth.—Refused.

Deviation from Certified Plans.

Strand.—A deviation of the plans sanctioned

for the rebuilding of Nos. 118 and 120, Wardour-street, Strand, so far as relates to a modification in the erection of the new building (Mr. W. Woodward for Mr. J. Newell).—Consent.

Means of Escape at Top of High Buildings and Construction.

St. George, Hanover-square.—Means of escape in case of fire, proposed to be provided in pursuance of section 63 of the Act, on two stories of the rear block of No. 33, Dover-street, Piccadilly, abutting upon Berkeley-street, for the persons dwelling or employed therein, and an iron and glass gangway at the level of the topmost story (Mr. J. S. Gibson for Mexborough House, Ltd.).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL SOCIETY.—At the meeting on the 16th inst., a paper was read by Mr. John Honeyman on "Certain Peculiarities in the Architecture of Iona." He said that so much had been written, descriptive and historical, about Iona, since the days of Lennant and Pocock down to the days of Champneys and Principal Story—late President of the Society—that on the present occasion he would strictly confine himself to some reference to peculiarities of arrangement or treatment which the existing remains exhibited, and he found that within reasonable limits he could only mention some of these. There was nothing peculiar about the plan of the Cathedral, as it existed now. The cloister was on the north side, but the contour of the ground accounted for that, as in many other cases. There existed, however, fragments of an older church at the north-west corner of the nave. There was a semi-circular headed door, which had been built up after all the freestone parts had been removed, and there was also a very peculiar structure connected with the old wall, namely, the lower portion of a tower, the entrance to which was by a small door, the sill of which was nearly 8 ft. above the ground. In this it resembled the round towers and a few square ones built in the XIth century and earlier. But it had this very unusual peculiarity, that it was built solid up to the level of the small entrance door. In the north wall of the choir there was a very unusual feature, two arches springing from abutments at each side and resting on a circular column 2 ft. 6 in. in diameter, the base of the column and the sill of the arcade being 6 ft. 3 in. above the level of the choir floor. Outside there was what now appeared to be a side aisle, to which access was obtained by a very beautiful door of much later date than the arcade. Although, since the insertion of this door the floor had been at nearly the same level as that of the choir, and the place was used as a sacristy, there was evidence that originally the floor was much lower, as during recent operations the remains of a floor 4 ft. 6 in. lower were found, and a piscina in the main wall of the building near the level of the present floor showed that there was here a chapel at a lower level. After explaining in detail and with the aid of illustrations what had led him to the conclusion, Mr. Honeyman said that he had come to the conclusion that at one period there had been a crypt at the east end of the cathedral, probably something in plan, though not otherwise, like that at Hexham, and that at that period the floor of the choir was 6 ft. 3 in. higher than at present, and that a side aisle existed on the north side. The window in the east wall of this aisle had a triangular head. After referring to the very beautiful and peculiar window in the east gable of the south aisle (just restored) the peculiar flying buttresses in that aisle, the archaic character of the arcading in the north transept, the evidence that the church had a flat ceiling, resting on corbels still existing about 4 ft. below the wallheads, with apartments over it, as at Torphichen, Lincluden, and elsewhere, reference was made to peculiarities in the chapter-house and cloisters. He thought it probable that the north side next the oldest part of the wall was much the same as the corresponding cloister at Oransay, but the other three sides were—as remaining fragments proved—on the beautiful model of some of the older Italian cloisters, the wall being carried on a continuous succession of smaller arches on coupled shafts, as, for example, at Amalfi, where the same arrangement, namely, a group of four detached shafts with bases and capitals respectively wrought on one stone, was to be found. At Iona the inner shafts were circular and the outer ones octagonal, but these latter had this remarkable peculiarity, that they were thicker in the middle by 1 in. than at either end, and had the beads at either end wrought on the shaft. Attention was next drawn to peculiarities in the belfry. The most remarkable of these was the treatment of the windows, which were filled with flowing tracery, while the inner face of the wall was carried on two flat rear arches, the springer between the two resting on a column of peculiar design. It had been surmised by some that these formed part of an older structure, probably of Norman date, but the lecturer did not favour that idea. He had no doubt they had been specially designed for the place they had to occupy, and their old-fashioned character was quite in keeping with much that had been done there even after the XIVth century, to the perplexity of Pugin and Parker. Above the belfry there was a chamber designed to be a dove-cot. There were small openings for light and air and larger ones for the pigeons, and a liberal supply of pigeon-holes built in the inner face of the wall in the usual way. It was possible that the position of the floor of this chamber suggested the squatness of the belfry windows, just as the position of the upper chamber in the church explained why the arches at the crossing and the windows in the gables are all kept so unusually low. The pigeon-holes in the walls of the tower had suggested a new idea, namely, that in our larger towers the comparatively useless space between the first floor and the belfry floor might be divided into columbaria, honeycombed with "cells" for the reception of urns containing the ashes from the crematoria when churchyards were abolished. He thought it would pay when people became a little more enlightened. In conclusion, he referred to certain earthworks a little to the north of the cathedral enclosure, and expressed the opinion that they had nothing to do with the works of Columba and his successors, but that they marked a very strong position occupied by the natives, and probably so occupied long before Columba's time. In the absorbing interest which the work of the great missionary saint inspired, they might be excused if they were prone to forget that the island of Iona had a history before his advent.—The paper was illustrated by drawings and photographs, and several plaster casts of monuments, lent by M. Alex. Ritchie, were exhibited.

LEICESTER SOCIETY OF ARCHITECTS.—At a general meeting of this Society, held on the 15th inst., the following resolution was passed—"That we, the Leicester and Leicestershire Society of Architects, at a general meeting called to discuss the subject of Statutory Qualification and Registration of Architects, do re-affirm our resolution of June 3, 1904, and are of the opinion that it is the duty of the council of the Royal Institute of British Architects, as representing the profession, to make serious and immediate effort to obtain Parliamentary powers for the purpose of establishing Statutory Qualification of Architects."

Fifty Years Ago.

THE COLOSSEUM, REGENT'S PARK.—When the Colosseum, in the Regent's Park, with the Cyclorama, in Albany-street, were put up to auction, at the Auction Mart, by the Messrs. Winstanley, the other day, the auctioneer stated that the Colosseum was erected after a design by Mr. Decimus Burton, at a cost of 23,000*l.*, for Mr. Thomas Horner, who held a lease of it direct from the Crown, at a ground rent of 262*l.* 18s. for a period of ninety-nine years, sixty-nine of which were unexpired on October 10, 1854. He subsequently expended above 100,000*l.* to carry out the objects for which it was intended, by decorating the interior, purchasing the pictures, etc. In August, 1836, the lease was sold to Messrs. Braham & Yates. Mr. Braham laid out about 50,000*l.* on the building, which in a few years became the property of Mr. Turner, who added the Cyclorama, which cost 20,000*l.*, to the establishment, with many decorations, which cost several thousand pounds, so that the entire edifice has cost above 200,000*l.* The sum of 20,000*l.* was bid, but as this was below the reserve price, the property was not sold. —The *Builder*, March 24, 1855.

THE ROYAL ACADEMY.—Mr. E. M. Ward has been elected an Academician; a better choice could not have been made.—Professor Hart's Lectures on Painting are being published *in extenso* in the *Athenæum*, and well deserve study. —The *Builder*, March 24, 1855.

Illustrations.

EXAMPLES OF FRENCH MEDAL ENGRAVING.

THE medals which are engraved here are the property of Mr. R. Phenè Spiers, and on looking over them with him we thought that it would be a good opportunity to give some illustrations of French medal engraving, an art in which French artists are superior to all others.

The most interesting example is the tablet presented to M. Pascal by his former pupils when he retired from his atelier, for this is the work of M. Chaplain, who may be considered to be at present the first medallion artist in the world. It is impossible to convey in the reproduction a full idea of the delicacy of the modelling of the foliage and other details on the reverse of the tablet; it must be seen in the round to be fully appreciated. The dates on the escutcheon hung on the tree represent the duration of M. Pascal's directorship of the atelier. The line engraved—

"Abrités par son ombre et nourris de sa sève"

gives the clue to the symbolism of the introduction of the tree. The line is, we believe, de Musset's, but we have not had time to look it up.

Of the other two medals, the one at the foot of the page was presented to Mr. Spiers by the Société Centrale des Architectes as an acknowledgment of the value of his paper on the Moorish vault, and the obverse represents one of the sculptural symbols of architecture which the Société Centrale has adopted. This is the work of M. Oudiné, a well-known French medallist. The other and more elaborate one at the top of the page is apparently the medal given on admission to membership of the Société Centrale; this is also executed by M. Oudiné, but it was specially designed by the eminent architect, the late M. Constant-Dufeux; the only case we know of in which a medal of this kind has been designed by an architect. Constant-Dufeux won the Grand Prix de Rome in 1829, and was successively architect to the Panthéon, the Luxembourg, and the Château of Vincennes. He was also professor of perspective in the Ecole des Beaux-Arts.

"ENFANTS ET GRENOUILLES":

PLASTER GROUP FOR A FOUNTAIN.

THIS charming and playful bit of sculptor's fancy stood near the principal entrance to the sculpture hall of the Paris Salon last year. It represents a group of three children perched above a fountain basin and amused by watching some frogs on the opposite margin of the basin. We have given another and larger view of the group below. M. Max Blondat is the sculptor.

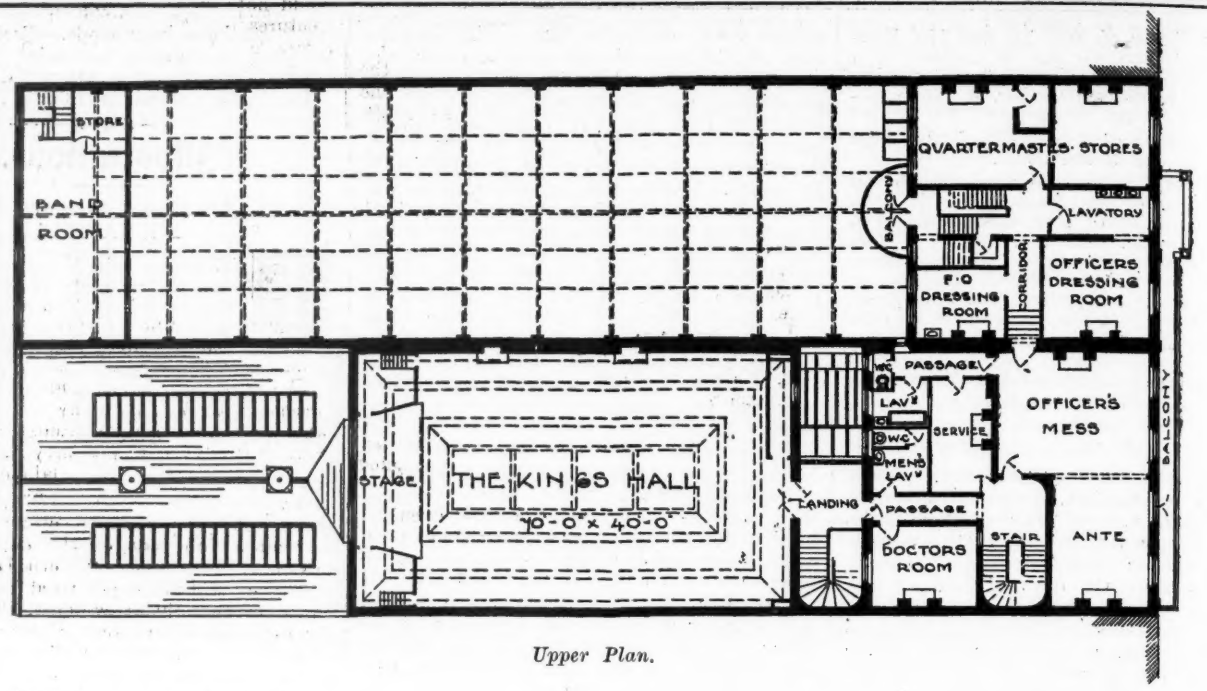
The natural attitudes and expressions of the children attracted the notice of every visitor who passed the group, which before the close of the exhibition was purchased by the Government.

A PAGE FROM THE ARCHITECTURAL ASSOCIATION SKETCHBOOK.

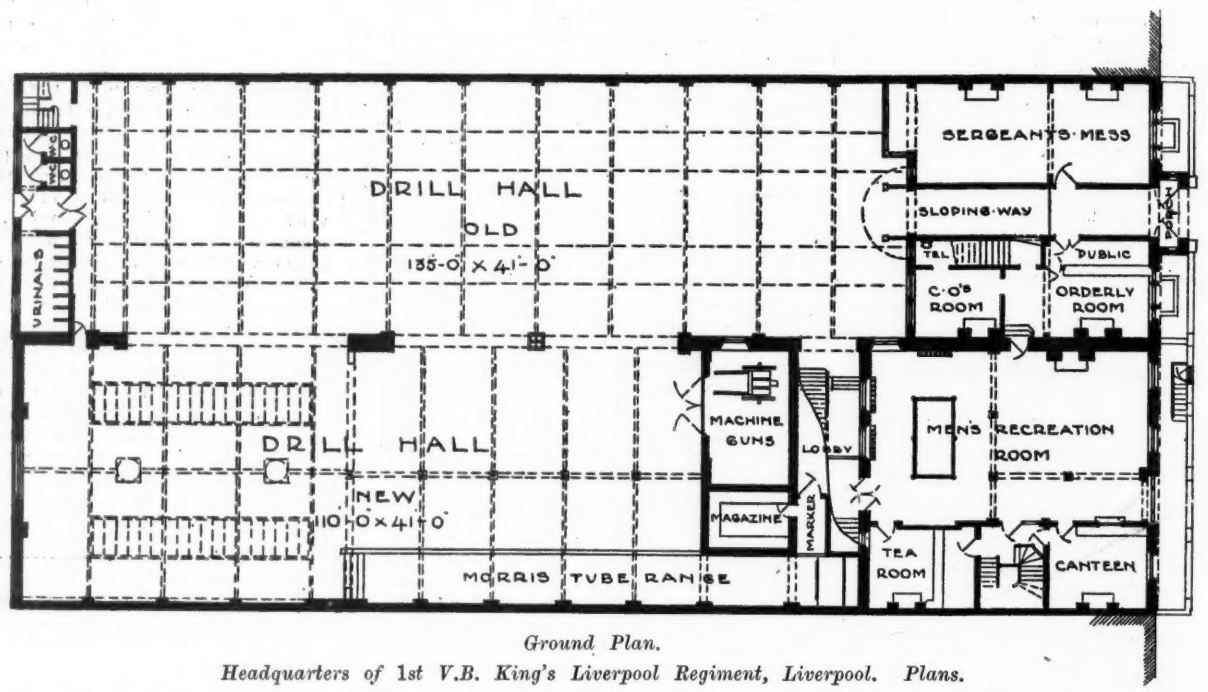
THE eighth volume of the Architectural Association Sketchbook is reviewed on another page of the present issue. We give a reproduction from the plate showing the arch of Trajan at Beneventum, drawn by Mr. Theodore Fyfe, as an example of the contents of the new volume. Mr. Fyfe sends us the following notes on the subject of his drawing:—

"The arch at Beneventum (now Benevento) was erected by the Roman Senate in expectation of Trajan's return from the Parthian War. The date of the structure is, therefore, about 114 A.D., and certainly before 116 A.D., as the title "Parthico" does not occur in the inscription. Trajan himself died in 117 A.D., and never saw the arch. But his was a great age of building activity—witness the famous pillar of Trajan at Rome, the arch at Ancona, the mole at Civita Vecchia, and the bridge over the Tagus at Alcantara.

The Benevento arch is not as well-known as it ought to be. As Fergusson has pointed out, it is the finest Roman arch in Italy, possibly anywhere, and its sculpture is unrivalled among Roman monuments. Gibbon ("Decline and Fall," Chapter XIV.) was in error when he



Upper Plan.



Ground Plan.

Headquarters of 1st V.B. King's Liverpool Regiment, Liverpool. Plans.

stated that the sculpture of this arch was removed to decorate Constantine's new arch in the Forum. It is quite apparent that the sculpture on the Benevento arch is complete.

The sketch shows the inner or town side of the arch, selected because of an easier viewpoint. But outside the impression is grander, as after a winding approach round the town walls, the arch is reached by a straight ascent between vineyards, so that the full effect of height is gained.

It is constructed entirely of white (probably Parian) marble, now much blackened with age. The upper cornice, and possibly some end portions, have been restored satisfactorily, but otherwise the structure is complete, and has weathered almost equally on outside and inside.

The sculpture mostly represents scenes from the life of Trajan. In the arched spandrels are two winged victories, and the outside spandrels have a river god and goddess, one of which is probably the Danube. The magnificent keystone should be noticed.

The jointing of the marble work is interesting. The actual arch has six *voussoirs* and a wide keystone, but the middle *voussoir* of each half embraces the top part of the shaft of the adjacent engaged column, and is cut to meet the curve of the projecting capital. On each pier there is a block which takes in the two capitals and the carved space between them.

The architectural details throughout are very good. I obtained no dimensions, but the scale of the arch can be roughly judged from the figure seated at the foot of the right pier."

HOUSE NEAR RUGBY.

WE gave in our issue of March 11 Mr. Simpson's drawing of this house, which had been exhibited at the Royal Academy. The present illustrations are from photographs taken from the actual building.

The plan and description of the house were given in the issue of March 11.

VOLUNTEER HEADQUARTERS, LIVERPOOL.

WE illustrate this week the headquarters of the 1st Volunteer Battalion King's Liverpool Regiment as recently altered and enlarged by the purchase of the old premises of the Oddfellows' Society, which adjoined the old headquarters in St. Anne-street.

The result of the alterations is that the regiment now possesses ample accommodation for all ranks of its establishment of 1,500 men. The difference of levels in the old houses has been overcome to a large extent and an effective elevation produced by the use of balconies, arcades, cornices, etc. The plans show that there is ample floor space for the drilling of men, the storage of arms, ammunition, and clothing, and offices for regimental work.

In the officers' messrooms on the first floor the old white marble chimney-pieces and mahogany doors from the old house are introduced. The sergeants' messroom is on the ground floor. The men's recreation-room is a feature of the new scheme, and there is a billiard-room, bar, service and tea rooms, etc.

Another feature provided is the old hall on the first floor, over the drill shed. This room is used, as the "King's Hall," for a gymnasium, band, and lecture hall, and also for social gatherings for officers and men. Residences for the sergeant-major and other members of the staff are situated on the second floor. A "Morris Tube" range is provided on the south side of the drill shed, with fireproof marking place, sliding, interchangeable targets, speaking tubes, etc., and is found to work very well.

The building is electric lighted throughout, and heating pipes are introduced in the "King's Hall" and in the armouries and workshops.

The amount of the grant from the Public Works Loan Commissioners for the purchase of freeholds and alterations to buildings was 8,500*l*. A separate fund was raised for the furnishing and decoration.

Mr. W. Hall was the general contractor, and the architect was Mr. Francis U. Holme, who is the colonel-commandant of the regiment.

FOLKESTONE TECHNICAL SCHOOL.

THIS building was provided by the Town Council, and affords accommodation in the basement for a kitchen and scullery for the use of the cookery classes; also a chemical laboratory and masters' room, with lavatories, heating apparatus, and domestic offices; on the ground floor there is provided a physical laboratory, science lecture-room, and lavatory; on the first floor are elementary and advanced drawing-rooms, masters' room, and cloakroom, and on the second floor a life classroom, with dressing and painting rooms and stores, and a large flat roof, used for outdoor painting.

The school gives accommodation for sixty-

six cookery students, and 106 science and 150 art students.

The four fronts are faced with local red bricks, with a liberal use of Corsham down stone for dressings. As the ground falls considerably towards the back, the foundations have been carried to a great depth, as much as 40 ft. in the rear of site.

The total cost, including site, was 11,506*l.* The builder was Mr. T. M. Moody, and the architect Mr. Frank Newman, both of Folkestone.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fifth meeting of the session was held at 32, Sackville-street on Wednesday, the 15th inst., Dr. W. de Gray Birch in the chair. The Chairman exhibited, on behalf of Mr. W. E. A. Axon, a fine photograph and several other illustrations of the very curious sculptured stone which was found during alterations in the foundations of the west wall of the south porch of Manchester Cathedral, in 1871, and is known as the "angel stone." The stone measures 13¼ in. by 8¾ in., and represents an angel, with extended wings, standing and holding a kind of scroll bearing an incised inscription, which Canon E. L. Hicks reads as follows, viz :—

IN MANVS T
VAS DM CO
MMED SP

"In manus Tuas Domine commendo spiritum" (meum). Considerable difference of opinion exists as to the real meaning of this stone and its date, and no completely satisfactory solution has yet been arrived at. A squeeze of the inscription and a carefully drawn full-size reproduction of the stone with a suggested completion of the defaced lower portion, by Mr. J. J. Phelps, were also exhibited. In Dr. Birch's opinion the sculpture and inscription belong to the VIIIth or IXth century, forming part of a larger work representing the Crucifixion. The stone is being carefully preserved by the cathedral authorities. The Rev. Dr. Astley exhibited, on behalf of Mr. Ludovic M. Mann, some sixty objects, many of flint, others of sandstone and quartz, part of a collection of about 1,200, found at Coulmore in the south of Scotland, on the site of a supposed pre-historic workshop. They are of the Neolithic Age, and consist of a large anvil and hammer stones of quartz, a rubbing stone of red sandstone, and many scrapers, wedges, pointed tools, flaking tools, knives, notched flakes, and arrow points, one being barbed and stemmed, another leaf-shaped. One curious feature of the find is that some of these implements seem to have been handled at a period earlier than that in which the workshop flourished, as they show evidence of the presence of two distinct patinæ on the worked surfaces; some also show signs of fire. No pottery was met with. This exhibition was very interesting in connexion with finds made recently by Dr. Astley and Mr. Andrew in earthworks at Castle Rising in Norfolk, evidencing a similar Neolithic workshop there. Dr. Astley also submitted some "lucky stones" and a perforated hammer from the Fens. Mr. Selley, through Dr. Astley, sent for exhibition some portions of Samian ware showing signs of fire, which were found near the site of East Gate, Exeter, at a depth of 10 ft. He also showed some pottery from the site of a Roman villa recently unearthed at Brislington near Bristol.—A paper was read by Mr. C. H. Compton, V.P., on "Villa Faustini," with reference to a letter in the *Standard* of Sept. 10, 1904, by Mr. Barham, of Bury St. Edmunds, in which that gentleman, describing some Roman remains he had found some three weeks previously at Sicklesmere, about two miles from Bury, raised the question whether that discovery had not localised the position of the "Villa Faustini" of the Itinerary of Antoninus. Mr. Compton said the locality of this villa has been a subject of much controversy. It is nowhere else mentioned in the Itinerary than in the fifth iter, and it is the third station in that iter. The Rev. Dr. Raven controverts Mr. Barham's hypothesis on the ground that the measures of distance in routes five and nine of Antonine's Itinerary preclude the location of Villa Faustini at the spot indicated by him. Mr. T. Codrington in his book on Roman roads in Britain, although not seeking for the identification of the Villa Faustini, goes into the question of the distances from Colchester, which may be very helpful. Mr. Compton had carefully measured the various distances on the one inch to the mile ordnance maps and compared them with the distances given in the Itinerary (assuming Colonia to be Colchester), and with those given by Dr. Raven and Mr. Codrington, taking as a basis 1,618 Roman yards to 1,760 English yards to the mile, and although he had not been successful in locating Faustinus' villa at the 35 miles distance from Colonia which was required, he hoped that the materials he had worked out would prove useful in determining the point at issue in the event of future discoveries, and he thought thanks were due to Mr. Barham for drawing attention to his interesting discoveries. Mr. Forster, Mr. Emmanuel Green, Rev. Dr. Astley, Mr. Maples, and the Chairman joined in the discussion which followed.

COMPETITIONS.

FREE LIBRARY, NELSON.—In this competition, for which 207 designs were sent in, the assessor, Mr. G. H. Willoughby, F.R.I.B.A., has awarded the premiums as follows: First premium, Messrs. W. Brandreth Savidge, and J. R. Poyser, joint architects (Nottingham); second, Messrs. David Bird (Manchester) and G. Fox (London), placed together; third, Mr. H. T. Rees (Liverpool). The assessor speaks very highly of the first premiated design, observing that "as a practical up-to-date, working library for a manufacturing town like Nelson it would, in my opinion, be hardly possible for the general arrangements to be much improved upon. It is evident the author has thoroughly mastered the salient points to be striven for in the successful planning of a Town Library."

BOOKS RECEIVED.

THE SANITARY INSPECTOR'S HANDBOOK. By Albert Taylor. Fourth edition. (H. K. Lewis. 6s.)

Correspondence.

"BANISTERS."

SIR,—How frequently nowadays we see in the newspapers the misused word "banisters" instead of "balusters." We do not hear of "banistrade," the form "balustrade" being properly used. Many may have noticed this; but, so far as I know, no one has thought it necessary to correct so curious an error, the origin of which is somewhat obscure.

E. SWINFEN HARRIS.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XII.

MAISON DE RAPPORT OF SEVEN STORIES.

AN excellent example of reinforced construction as applied to dwelling-houses in Paris is to be found at No. 29, Avenue Rapp, a street running from the Avenue de la Bourdonnais, on the north-eastern side of the Champ de Mars, to the Pont de l'Alma.

This structure, of the class known in France as *maisons de rapport*, is practically a residential hotel, and was built by MM. Combes et Lavirotte, a Parisian firm of architects, with the co-operation of M. Cottancin as structural engineer. Fig. 87 is an outline section through the principal façade, and gives the height of the different stories, and Fig. 88 is a plan of the third story, which serves to indicate the general arrangement of the building. In order not to depart altogether from the methods of construction generally followed in Paris, the architects decided to employ cut stone for building the basement walls, the masonry being carried up to the first story on the façade upon the street and to the street level on the façade upon the *grande cour*, or interior court. The adoption of stone precluded the application of reinforced construction for these portions of the building, and the walls of the cellar were built in ordinary masonry up to the ground level of the court, with the exception of certain details which are described below.

The walls of the small courts, distinguished (see Fig. 88) as the *petite cour* and the *courette*, of the grand staircase, and of the service staircase are in reinforced brick, all 11 centimetres thick. Four columns in the vestibule, standing upon a caisson foundation at the level of the basement floor, are of reinforced brick with a cross-section of 22 centimetres square up to the level of the ground floor. These slender columns support, together with the *courette*, the lift casing and the enclosure of the grand staircase nearly all the weight of the front portion of the building. The walls of the *courette*, of the lift casing, and of the grand staircase are all in reinforced brick of the thickness mentioned above. In the vestibule the square columns have been brought to cylindrical form by an outer coating of cement, stuccoed and decorated to imitate the marble panelling of this apartment.

Those walls which are of reinforced brick, as well as the four columns, are built upon caisson foundations very similar to those described in Art. VIII., p. 213, the sides of the caissons being of reinforced brick 11 centimetres thick, with a cover formed by a slab of reinforced cement 5 centimetres thick.

Under the walls of the building in the Avenue Rapp the footings are 30 centimetres wide by 40 centimetres deep. Fig. 89 is a perspective by which it will be seen that the sides of the caisson consist of five courses of brick, each 7 centimetres high by 11 centimetres wide. The bricks in the wall standing upon the reinforced slab are of the same dimensions, and are reinforced by steel wires of 4·4 millimetres diameter (No. 20 French gauge) passed through the holes, which are afterwards filled up with cement mortar. These wires are tied with horizontal wires of the same gauge laid in the joints to form a network capable of taking all tensile stresses developed in the structure. The number of wires used in the vertical holes and in the joints of the bricks is proportioned so that adequate resistance shall be insured in all parts of the wall.

In places where the number of wires necessary may be too great to permit them to be woven into a network, the practice is to use a bar of steel of the required dimensions in place of a bundle of wires.

The reinforced brick walls of the *petite cour*, the *courette*, the grand staircase, and the service staircase, all built in the manner here described, extend from the basement to the eaves—that is, through eight stories in all.

For the four columns mentioned above, the foundations consist of caissons 70 centimetres square by 40 centimetres deep, the upper slab being of reinforced cement 5 centimetres thick. Fig. 90 is a perspective sketch of a typical foundation, with a portion of the column. The sides of the caisson consist of four brick walls 11 centimetres thick, all reinforced by steel wires of 4·4 millimetres diameter, these being securely connected with the steel network of the cement slab. The column, of which a few courses are shown in the same illustration, is built with two bricks in each course, the joints of alternate courses being at right angles so as to give a proper bond. The reinforcement at the corners consists of bars of steel, and in the other vertical holes of 4·4-millimetre steel wire. As in the case of the column section in Fig. 78, p. 301, the vertical reinforcement is interwoven with horizontal wires, and the four corner bars are connected by diagonal ties.

The load upon the reinforced walls and columns is very considerable, since the floor loads are transmitted chiefly through them to the foundations.

All the floors of the building, from the basement to the top story, are formed of concrete-steel, the same material being used for the flat portions of the roof and for the paving of the courtyard, which is intended for use by carriages and motor-cars. Each floor is finished with a slab of cement-steel 5 centimetres thick, in which the network of steel is disposed in meshes of dimensions graduated in proportion with the resistance required at each point. Each panel of reinforcement is connected to those adjoining by hooking and binding together the separate wires and bars of the metal so that the entire surface of each floor really consists of a single monolithic slab of cement, the reinforcement of which is one connected system, formed of several smaller panels woven together. To employ a homely illustration, it is somewhat like the patchwork quilt which was formerly to be found in every well-regulated home.

The floor-panels are laid upon concrete-steel stiffening ribs 20 centimetres deep by 5

centimetres wide, arranged in accordance with the systems of triangulation, of which one example is represented by the broken lines in Fig. 88. The arrangement of the triangulation varies from floor to floor, and is in every case designed to suit the precise conditions of loading. The stiffening ribs are termed by the originator of the system *épines-contreforts*, or counterfort-spines, with the object of indicating that they are not to be regarded as independent beams or joists, but rather as members analogous to the ribs and backbone that reinforce the body of a vertebrate animal. In the case of the building now under consideration all such members were made beforehand in an extemporised workshop in the basement, with the threefold object of ensuring satisfactory execution, of obviating the necessity for the costly system of beam moulds and struts usually employed in the construction of concrete-steel floors, and of avoiding enforced stoppages of work during the hardening of concrete in the beams and joists.

Concrete members formed in moulds on the floor of a building are certainly not moulded under the most satisfactory conditions. The concrete is deposited by unskilled workmen, and, as the moulds are rapidly filled, it is more than probable that the material is never properly tamped as layer after layer is deposited. Hence there is considerable risk of voids and faults which cannot be rectified when once the work has been finished.

In the case of the *maison de rapport* in the Avenue Rapp, the ribs were moulded flat, as sketched in Fig. 91. Here the dimension 20 centimetres represents the depth of the rib, but, as the member is moulded on its side, the depth has no influence on the quality of the work, and the concrete can be thoroughly tamped in accordance with the requirements of good practice. The rib illustrated in Fig. 91 may be taken as typical of those used throughout the building now under discussion. The reinforcement includes two bars of steel, one at A and the other at B, longitudinal wires (*a*) and transverse wires (*b*), each of the latter being tied to the bars A and B, and forming a loop (*c*) projecting through the top surface of the rib. The area of steel in the bars A and B depends upon the duty of the rib. The wires (*a*) are in spiral coils of flattened form, and the wires (*b*) are straight, the diameter in each instance being 4·4 millimetres. The projecting loop (*c*) is for the purpose of incorporation in the floor slab, and forms part of its reinforcement. Of course Fig. 91 is merely a section at one point in the length of the rib, and it must be remembered that transverse wires as (*b*) occur at frequent intervals, forming with the longitudinals (*a*) a complete network in the concrete, and helping to bind the whole floor construction together.

After the ribs of this general type had been moulded in the workshop and had hardened sufficiently they were turned out from the moulds and stored on the basement floor in an upright position. A large quantity of these members was moulded during the building of the masonry walls of the basement, and, being stored in the manner stated, they occupied comparatively little floor space. Being finished well in advance of the time when they were wanted for use, the concrete had thoroughly hardened, so that the ribs could be handled without injury and hoisted to the required elevation by means of tackle, just as if they had been of steel or timber.

To show how small is the risk of damage to concrete-steel members moulded in advance and thoroughly hardened, we may mention that, when a rib of the kind described above and 7 metres long was being hoisted during the construction of the Lycée Victor-Hugo, the chain of the lifting tackle broke and the rib fell from the fifth story to the ground, where it arrived in a vertical position. Notwithstanding the tremendous shock and the great length of the rib, the latter was not damaged in any way, and, as soon as a new chain had been fitted to the hoist, it was raised to the desired point and built into the floor system.

It often happens, as may be seen by reference to the plan (Fig. 88), that two ribs cross each other. In such cases a "halving joint" is adopted somewhat similar to that used in carpentry. To make this joint, one rib (as N in Fig. 92) is first fixed in position and below it is placed another rib P made without the bar A. In Fig. 92 the rib P is shown in its final position.

Then a notch from the top down to the bar B is cut in the concrete of the second member at the point of junction. The wires (*a*) are also cut, and P is lifted so that N penetrates as far as the bar B.

Then at the point of intersection the concrete of the rib N is cut away from A to B, and the bar B of one rib can be brought into contact with the bar B of the other as indicated by the dotted outlines at the middle of Fig. 92. Then the two bars are tied together. This is done by means of two spiral windings of 4·4-millimetre steel wire, the windings crossing each other at right angles.

The wires (*a*) of the rib N have not to be cut, and the ends of those in P which have been cut are jointed together, thus restoring the arrangement which existed before they were disturbed.

Cement mortar is then applied to fill up the space of the concrete removed from the two ribs at the point of intersection, and the bar A, omitted from the rib P, is passed through the loops (*c*) of that rib. At the point of junction the bars A of the ribs N and P are securely wired together to make a firm connexion. This joint is also covered with the mortar, through which project the loops (*c*). In Fig. 92 the loops at the point of intersection of the two ribs are omitted for the sake of clearness. As the bars A and B of the two ribs are not halved together, it is clear that their top surfaces cannot be brought to the same level, but this slight difference is made up by the thickness of bar A of the second rib, which rests upon the top surface of the concrete.

In this manner a joint is made at the junction of two members without impairing the strength of either, as inevitably occurs when a joint of the kind is made in steel construction. Fig. 93 represents N in elevation and P in section after the joint has been completed, and from this sketch the relative positions of the bars A and B can be readily understood.

When the mortar of the joint is well set the space between the stiffening ribs is spanned by plates of reinforced plaster 2 centimetres thick. These plates are supported by cleats of wood wedged or otherwise held in position against the sides of the ribs, and over them is spread a network of steel rods. This network is made beforehand in a suitable workshop, and its meshes pass between the loops (*c*) projecting from the stiffening ribs (see Fig. 92). Next the loops are bent downwards successively, from one end to the other of each rib, so that they form a kind of chain which imprisons the network spread over the plates of plaster. In this way the reinforcement for the floor slab is formed, and the armoured plaster plates constitute the centring for the formation of the floor slab. The material for this purpose consists of 1 part of Portland cement and 2 parts of sand, the first layer being mixed very wet to enable it to pass freely beneath and between the steel wires and rods, while, to assist

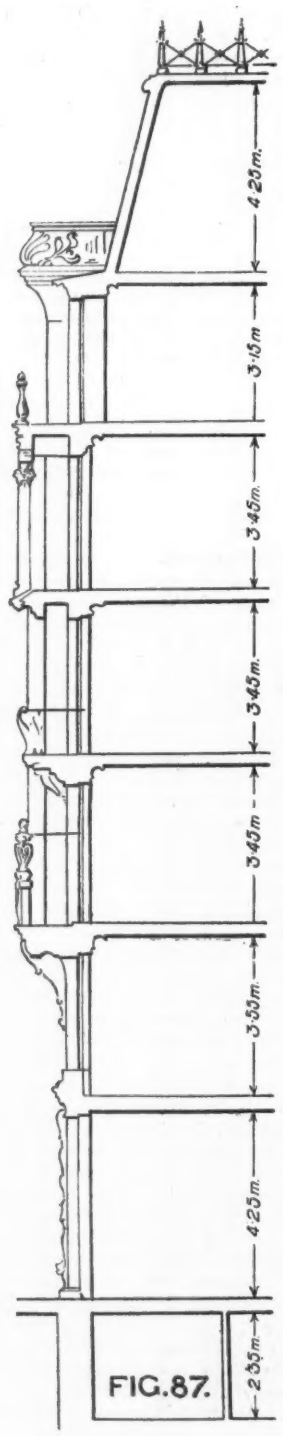


FIG. 87.

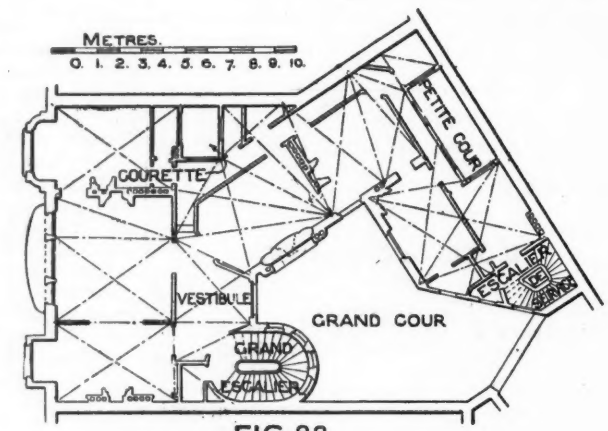


FIG. 88.

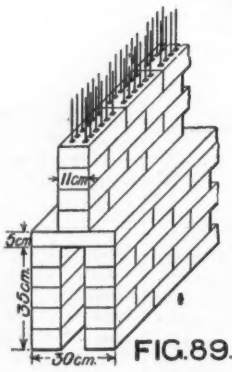


FIG. 89.

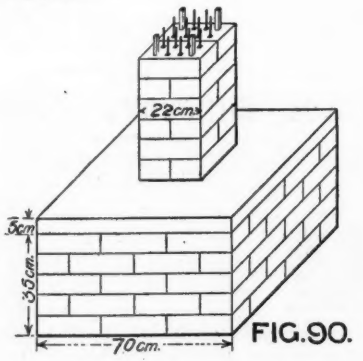


FIG. 90.

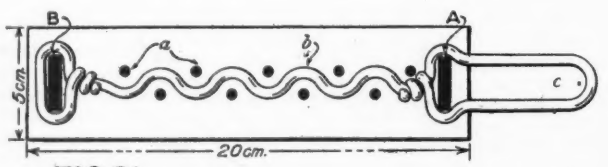


FIG. 91.

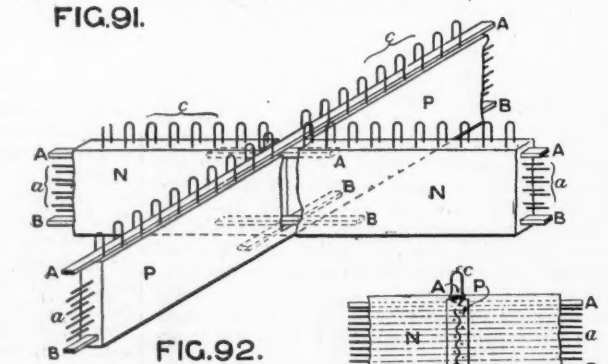


FIG. 92.

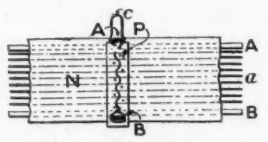


FIG. 93.

Illustrations to Student's Column.

the penetration of the mortar, the network is lifted up by means of hooks. The second layer of mortar is mixed very dry in order that it may suck up the excess of water in the bed below. In this way a homogeneous floor slab 5 centimetres thick is formed over the whole surface to be covered.

In places where it is desired to lay wood flooring strips of timber are bedded down upon the first layer of mortar, and are held in position by nails driven into the sides of the strips so as to project head downwards at an angle of about 45 degrees. The heads of the nails catch in the meshes of the reinforcing network, and are securely held by the surrounding mortar. Floor boards can then be nailed down in the ordinary manner.

It should be added that some of the stiffening ribs are made with beaded projections along the lower part of each side, thus forming ledges, which are used in the first place for supporting the cleats by which the plaster plates are held in place during the construction of the floor slab. After the slab has set, the cleats are removed and the sheets of armoured plaster are lowered until they rest upon the projecting ledges of the stiffening ribs and there remain as the permanent ceiling. Thus, when the joints are plastered up, a hollow ceiling is formed, confining an air cushion, which minimises the transmission of sound and the conduction of heat.

By the foregoing description, it will be seen that the method of construction quite obviates the necessity for expensive moulds and floor centring; while, as the ribs, the reinforcing network, and the armoured plaster plates can all be made in advance, there is no reason for tedious and costly delays during the erection of the building.

In our next article some other features of the *maison de rapport* will be dealt with.

COURT OF COMMON COUNCIL.

THE usual meeting of the Court of Common Council was held on Thursday last week at the Guildhall, E.C., the Lord Mayor presiding.

Duke's Head-passage.—The Improvements and Finance Committee submitted for adoption an arrangement for widening and converting Duke's Head-passage into a carriage-way between Ivy-lane and Paternoster-square. The cost was estimated at 1,825*l.*, which sum would include all interests. After some discussion the arrangement was adopted.

Widening of Fleet-street.—The same Committee recommended, and it was agreed, that an arrangement should be entered into for acquiring the ground needed to widen the public way in front of No. 69, Fleet-street. The sum required for the leasehold and freehold was 2,220*l.*

Electricity Bills.—A letter was received from the London County Council relative to the Supply of Electricity Bills now before Parliament asking the Corporation to nominate two representatives to attend a conference of local authorities on the subject.

ADDITIONS TO GIRLS' HIGH SCHOOL, MANCHESTER.

THE Biological Laboratory, opened on March 3, at the High School for Girls, Manchester, is another addition to that already important building.

Since the school was erected, in 1881, additional chemical laboratory, lecture-room, and gymnasium were added in 1886, and the last addition, whilst not materially extending the building, has been so designed as to provide, on the first floor of the south-west wing, a cookery school, and, above it on the upper floor, a biological laboratory, with the necessary conservatory and hothouse.

In the cookery school, 20 ft. by 32 ft., in addition to a gas stove, a large range of the "Wharncliffe" type has been erected, and in close proximity is a large glazed earthenware sink, with drainer, plate-racks, etc., shelving for cooking utensils, and a large kitchen dresser, comprising the necessary fittings for practical working. These are placed at that end of the room which has recently been erected, and has the walls up to the ceiling level faced with white glazed bricks. The remainder of the room, with its walls and ceilings of cream and white enamel, is given up to the benches and tables for the students.

Immediately below, on the ground floor of the building, is the school kitchen, etc., and a dinner lift has been arranged, giving communication between this and the new cookery school, also a telephone between the two departments is utilised to the greatest advantage, and any stores required for demonstration purposes are at once obtained from the school supply.

The biological laboratory has been formed by utilising an old lecture-room, nearly 40 ft. long by 25 ft., in the roof of which top light has been placed. From the plan it will be noticed that benches against the side walls give accommodation for seventeen students, whilst, in the centre of the room, on a table bench, is provision for a further twelve. Under the latter bench are arranged drawers and cupboards for specimens, students' instruments, etc., and at the end is a large glazed earthenware sink, with two pairs of taper taps, supplying hot and cold water. A second sink, having a drainer, is provided against the wall near to the lecturer's table. The tops of the benches are all of teak.

Under the side benches are heating pipes, and a space is left between the bench and the dado to allow of the heat rising into the room itself, but it is kept from the students' legs by a wooden curtain arranged in a series of flaps, which can be lifted for the purpose of cleaning or attending to the heating pipes. Each student is provided with a special chair and a foot-rest.

Gas, with separate connexions for movable standards, etc., is provided for each student.

In the centre of the north-west end of the room is a large cupboard, the lower part of which is fitted partly for mounted diagrams, and partly as specimen shelves, whilst cupboards with glass doors form the upper portion, and in which are kept specimens in spirit.

Close to this fixture and in the corner of the room is built a slate slab for the purpose of growth experiments, which, although in the upper part of the building, is practically rigid.

The lecturer's table forms the chief fitting at the other end of this laboratory, and is of the usual type, fitted with cupboards, drawers, etc., and with a sink in the centre, with a glass front facing the students, which can be utilised or completely hidden from view as the lecturer desires.

From the platform on which this table stands, the lecturer controls the sliding blackboards, which are balanced so as to be easily raised or lowered, are made of glass, and of the most modern description. Corresponding with the blackboard, the opposite side of this platform, is a frame for diagrams, a portion being fixed, and the remainder being balanced for raising or lowering.

In arranging this laboratory, such matters as test-tube drainers, diagram stands, etc., have not been overlooked. Over the dado at one side is a rack in which can be exhibited specimens in frames of glass-topped boxes.

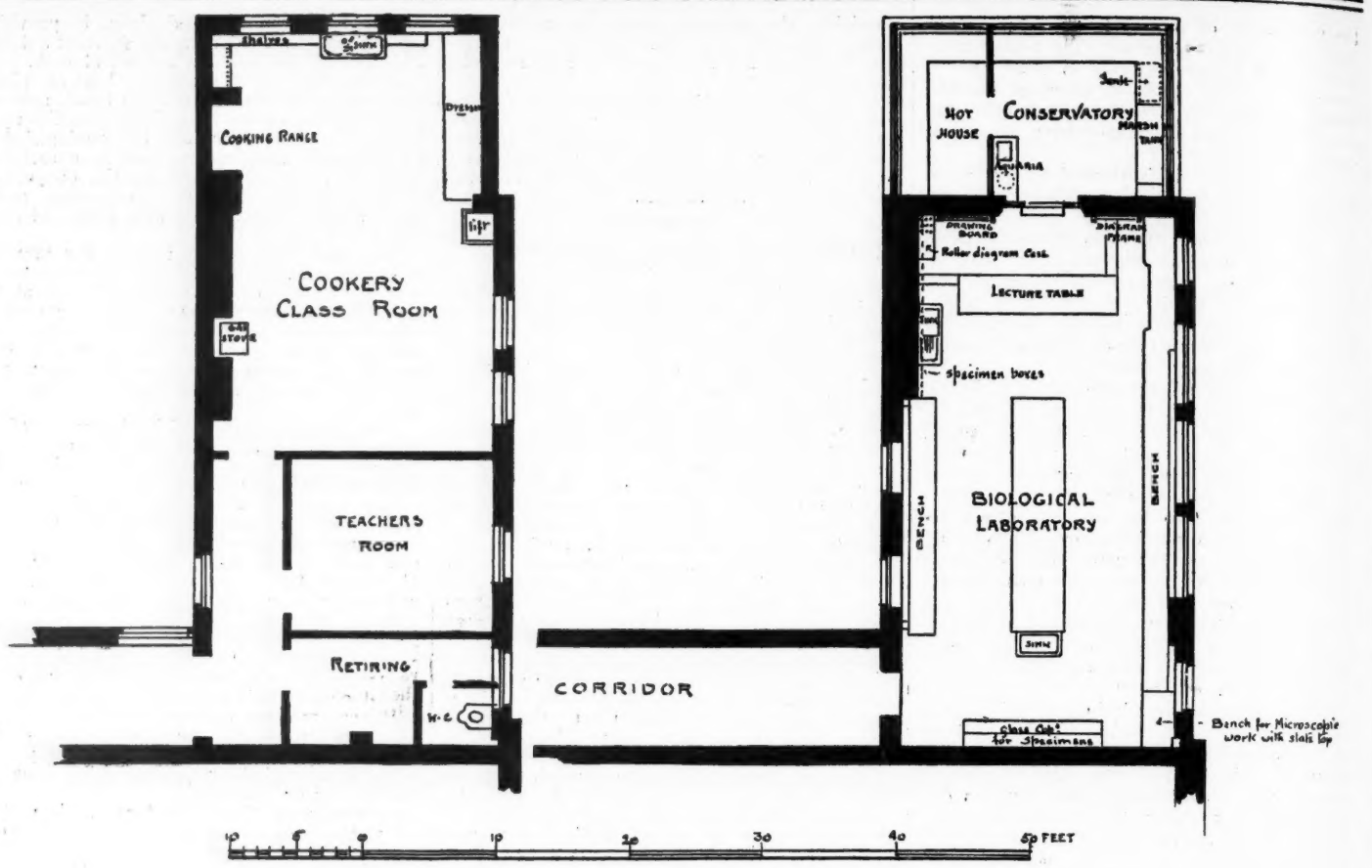
At the back of the lecturer's table is the entrance to the conservatory, out of which is entered the hothouse.

In the latter are various fittings, such as a water tank, shelving, with slate bed, covered with charcoal and coke, and heating pipes arranged to be used either separately or in conjunction with those in the conservatory.

In the conservatory, besides the staging, as in the hothouse, there is a plentiful supply of shelves, and there is a lake garden (the gift of the School Field Club), or a large tank in which can be grown water or marsh plants; this has a glass front, and is made of slate; it can be filled with rain water from the roof or from the town's water as desired.

On a long table, on the other side, stands

Biological Laboratory, Girls' High School, Manchester. Messrs. Mills & Murgatroyd, Architects.



Additions to Girls' High School, Manchester. Plans.

fresh-water and marine aquaria, which can be kept fresh by an aërative apparatus when necessary. The greenhouse is lofty, and here it is intended shall be carried out experiments on plants which can be under continuous observation.

The whole of the alterations and additions have been carried out from the plans and under the superintendence of Messrs. Mills & Murgatroyd, architects, of Manchester.

OBITUARY.

MR. PERTWEE.—The death, on March 19, is announced of Mr. Charles Pertwee, at his residence, Claremont, Chelmsford, in his 73rd year. Mr. Pertwee, who was formerly Surveyor to the Borough of Chelmsford, was elected an Associate of the Royal Institute of British Architects in 1881. He was employed as architect in respect of a large number of schools, hospitals, churches, and chapels, chiefly in his own county. Amongst his works of that kind are included the following:—Congregational Chapel at Great Wakering; restoration of Great Baddow parish church, 1897; enlargement of the Congregational Church Schools, Dunmow; and of the Sunday Schools and the Congregational Church Schools at Brentwood; the Boys' and Girls' School, Moulsham; laboratory and workshop, King Edward VI.'s Grammar School, Chelmsford; Congregational Church, Baddow-road, Chelmsford; school-room and offices, Hall-street, Chelmsford; and the entire renovation of the Congregational Church and Sunday Schools, Kelvedon. He was architect of the additional wards, etc., at the Chelmsford Infirmary, 1896; and of a house, for Mr. A. Miller, at Rainsford End. He acted as joint architect with Mr. Frank Whitmore (in 1900) for the alteration and enlargement of the London and County Bank, Chelmsford. During the past five or six years he and his partner, practising as Messrs. Charles & W. H. Pertwee, of London and Chelmsford, were the architects for the additions to and the alteration of Nos. 67, 69, and 71, Southampton-row, London, W.C.; the Congregational Chapel, West Roding; the Isolation Hospital, near Sutton Ford Bridge, Rochford, for the Rochford Rural District Council; new premises for the Chelmsford Star Co-operative and Industrial Society; the church manse, Tiptree Heath; an enlargement of Prince's Skating Club, Knightsbridge; the Isolation Hospital, with administrative block, offices, etc., in Deadman's-lane, Great Dunmow, for the Dunmow District Council; and, in May, 1900, they were awarded the third premium for their designs, out of thirty submitted in the competition, for the police headquarters at Chelmsford.

MR. ARDING.—Mr. John Bennett Arding, of No. 22, Surrey-street, Strand, died at his residence, Newark House, Palace-road, Streatham Hill, on Friday, March 10, aged 76 years. He was senior member of the firm of Messrs. Arding, Bond, & Buzzard, architects and surveyors, which was dissolved in June last year. Mr. Arding was elected an Associate of the Royal Institute of British Architects in 1857; he became a member of the Architectural Association in 1848, and was a Fellow during thirty-five years past of the Surveyors' Institution. He was clerk and surveyor to the Bowyers' Company for many years, and was latterly renter-warden of that Company. Messrs. Arding, Bond, & Buzzard were the architects, in 1886-7, for the entire internal reconstruction of No. 429, Strand, for the British Medical Association.

MR. A. T. WALKER.—We have to record the death, in his 70th year, of Mr. A. T. Walker, A.M.Inst.C.E. Mr. Walker, who was a native of Aberdeen, was formerly in the service of the Cambridge University and Town Waterworks Company; and thence, in 1875, went to Reading as sub-manager of the Waterworks Company there, and was appointed their manager in 1883. In that capacity he carried out the high-level service reservoir at Tilehurst, and other important works connected with the water-supply of the district.

MR. ELLIS H. PRITCHETT.—The Hon. Secretary of the British Fire Prevention Committee sends us some particulars as to the death of Mr. Ellis H. Pritchett, of Swindon, who was a Fellow of the Institute of Architects and of the Surveyors' Institution, and appears to have given special attention to the subject of fire prevention, since he was chief officer of the Swindon Fire Brigade, a member of the executive of the British Fire Prevention Committee, and a member of their special commission which visited the principal cities of Central Europe last year. The funeral, which took place at Swindon on Wednesday, was conducted on fire service lines, the brigades of the West Midland district of the National Fire Brigades' Union parading in full uniform under the district chairman, Mr. C. O. Gardner, of Stroud. The British Fire Prevention Committee was represented by its Chairman and Hon. Secretary, and several members, as was also the International Fire Service Council.

YEOMANRY HEADQUARTERS, HULL.—The new headquarters of the Hull squadron of the East Riding of Yorkshire Imperial Yeomanry, and a club for the whole regiment, were opened on the 11th inst. The buildings comprise a riding school and officers', non-commissioned officers', and troopers' messes. The contractor for the work was Mr. T. J. Windlass, and Messrs. Thompson & Kirton were the architects.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, SALTLEY.—The new Wesleyan Methodist Church, which has been erected at a cost of 4,000*l.* on a site in the Alum Rock-road, Saltley, was opened on the 15th inst. by the Lord Mayor. The building provides sittings for 500 adults on the floor and 400 in the galleries. Underneath the choir gallery is a vestry, and space has also been reserved for four classrooms. The choir in which the organ is placed is 28 ft. by 20 ft., and opens to the church by a wide arch, while on the floor in front is placed the rostrum. Two rows of stone-coloured terra cotta columns and arches carry an open-timbered lofty roof, while the columns at the same time support the galleries. The church is built of red bricks, with stone-coloured terra-cotta dressings. The work has been carried out by Mr. W. Bishop, of King's Heath, from the designs of Mr. Arthur Harrison, architect, Birmingham.

CHURCH, DEVONPORT.—The foundation-stone has just been laid of the new church attached to the Devonport Royal Naval Barracks. The church will consist of a nave 40 ft. wide, with narrow aisles to serve only as passages, chancel, side chapel, baptistry, vestries, and organ chamber, and will provide seating accommodation for 1,000 officers and men, all on the ground floor. In the design advantage has been taken of the slope of the ground to obtain a large choir vestry under the chancel; this will serve as a room for meetings. The materials will be local limestone for the walling, with Portland stone dressings outside and Monk's Park stone inside. There will be an open timber roof to the nave, and a barrel roof with ribs to the chancel, these roofs being covered with green Westmorland slates. The aisles, chapel, and baptistry will be roofed with concrete. The design, which has been prepared in the head office of the Works Department of the Admiralty, is of a simple character, with round arches throughout and tracery in the large west window. The work is being executed by Mr. A. Carkeek, contractor, under the supervision of Mr. W. J. Clarke, M.Inst.C.E., Superintending Civil Engineer of Devonport Dockyard.

SYNAGOGUE, NEW CROSS.—The synagogue, which has been erected on the Fairlawn Estate in New Cros-road, was recently consecrated. The building, erected from drawings by Mr. Delissa Joseph, is of Romanesque design, built in red brick, and provides accommodation for 200 gentlemen on the ground floor, and 150 ladies in the gallery. At the rear are classrooms for the religious instruction of Jewish children and congregational meetings.

NEW TECHNICAL COLLEGE, EAST HAM.—The Prince of Wales, accompanied by the Princess, opened, on Saturday last week, the new Technical College at East Ham. The new

Technical Institute and Secondary School is of red brick, with terra-cotta dressings and carved reliefs. Situated just off the main street in a wide thoroughfare, it stands close to the recently erected municipal buildings, with which it harmonises in style. The cost has been 24,000*l.* There are entrances on both the north and west sides, the latter, which faces the municipal buildings, leading into a hall having a double staircase of Carrara ware leading to the upper floor. The walls of the two halls and of the corridors throughout are faced with glazed white tiles, with a dado of green tiles surmounted by a heavy moulding of polished wood, while the floors are terrazzo and concrete. All the rooms are floored with polished oak. The assembly-room, in the centre of the north side, is lit from the roof with stained glass, and is panelled, the tympanum of the doors being carved. Eight classrooms occupy the remainder of the principal floor, all fitted with oak desks and chairs. On the upper floor are the rooms devoted to the arts and sciences. Here are a botanical-room, chemical classroom, and laboratories, and modelling and art-rooms completely furnished with casts. On the ground floor provision is made for the pursuit of various crafts—plumbing, metalwork, brickwork, etc., together with a carpenter's shop and physics laboratory. The architects are Messrs. Cheers & Smith, of Twickenham.

EXTENSION OF THE ART GALLERY, MANCHESTER.—A meeting of the special committee *re* the extension of the Manchester Art Gallery was held on the 16th inst. in the Gallery, Mosley-street. A scheme for carrying out a temporary extension of the gallery till the new site, now occupied by the Royal Infirmary, is ready for use has been prepared at a cost of about 5,000*l.* In view of existing circumstances this amount was considered to be too large, and the special committee were requested to prepare a scheme of extension of a less costly character. Mr. Price, the City Architect, was present at the meeting.

GOVERNMENT BUILDINGS, WHALE ISLAND.—The Admiralty have sanctioned an estimated outlay of about 50,000*l.* for the enlargement of the officers' quarters at Whale Island so as to provide for the accommodation of sub-lieutenants who, for their course of gunnery instruction on the island, are at present quartered in the college and dockyard at Portsmouth. The contract is taken by Messrs. Patman & Fotheringham, who will extend the existing block some 120 ft. westwards with a return northwards as far as the stables, to accommodate a further number of eighty officers. The messroom will be enlarged to nearly thrice its size; the billiard-room is to be absorbed into the smoking-room, and two new billiard-rooms will be provided; the cardroom is to be added to the hall; corresponding additions will be made to the servants' quarters; and the kitchens, offices, cellars, etc., belonging to the officers' quarters will be set back on the north side and divided from the men's block by a passage about 15 ft. wide.

PAVILION AND RECREATION PARK, DUNOON, N.B.—The laying of the foundation-stone of the new pavilion in connexion with the Castle Gardens, Dunoon, and the cutting of the first sod of the recreation park, took place on the 11th inst. The work is being carried out from designs by Mr. Fraser, architect.

WAREHOUSE, GLASGOW.—A new warehouse has been erected at the corner of Nelson-street and Trongate, Glasgow, and immediately adjoining the "Old Tontine." The entire building is from plans by Messrs. Thomson & Sandilands, I.A., Glasgow.

THEATRE, ABERDEEN.—Operations have now commenced for the erection of the new theatre in Aberdeen upon the site immediately east of the United Free South Church. The ground feued by the Theatre Company has a frontage of 127 ft. in Rosemount-viaduct, but 10 ft. of this frontage nearest the church must remain unbuilt upon. The feu extends northwards a distance of 139 ft., and reaches the proposed new line of Skene-street. The plans of the new building have been prepared by Messrs. Frank Matcham & Co., architects, London. The lower or basement floor is 28 ft. below the level of the Viaduct, and will be occupied by electric light and steam heating plant, and the surplus area as a property-room. Above the basement is the pit floor, which contains three different sections of seating accommodation—viz., the orchestra stalls, pit stalls, and pit. Adjoining the pit on the east side is a refreshment saloon. The north side of this floor is occupied by the orchestra and stage, with a private box on either side. The floor above the pit floor is on a level with the Viaduct, and contains all the main entrances. The vestibule is about 35 ft. by 20 ft., and from it access is obtained to the dress circle and orchestra stalls. The two floors above the level of Rosemount-viaduct are occupied, the first as the upper circle, and the second as the gallery. From the vestibule there is also direct access to the lounge, refreshment saloon, and ladies' retiring-rooms, etc. Seating accommodation will be provided for about 2,350 persons. The dressing-rooms and other offices and appointments are situated along two sides of the stage. The auditorium is separated from the latter by a fireproof curtain. The front exterior is to be wholly built of white Kemnay granite, and the other elevations of Tillyfourie stone. The contractor for the mason work is Mr. Alex. Anderson, Aberdeen. The estimated cost of the structure when completed is 35,000*l.*

THE TOWER BRIDGE POLICE COURT.—The Tower Bridge Police Court, which is to take the place of the existing Southwark Police Court, has just been completed. Excluding the site, for which 19,000*l.* was paid, the cost of the building, together with the adjoining police station, which was opened last autumn, has been 45,000*l.* It has been erected from designs by the Police Surveyor (Mr. J. Dixon Butler). The exterior of the court is of Portland stone and red brick, with granite base. A circular porch with Corinthian pillars, surmounted by the Royal Arms, forms the main entrance. There is a large entrance hall, and on the ground floor is the principal court-room. On the first floor there is another court-room, thus permitting the civil cases and the criminal cases to be dealt with separately. Accommodation is provided for witnesses and other persons having business at the court. There are thirty cells for prisoners under remand, and also waiting-rooms for both male and female prisoners. The whole block of buildings, which was begun two years ago, stands on a thick raft of concrete, it being found practically impossible otherwise to obtain a stable foundation.

NEW FACTORY, BROMLEY, E.—The removal of the billiard-table works of Messrs. Burroughes & Watts from Westminster to Bromley-by-Bow has now been completed. The workshops, offices, and caretaker's apartments at Bromley cover a site of about 1 acre. Messrs. Francis Morton, jun., supplied the steelwork, and Messrs. Joseph Cliffe & Sons the Lethaby green glazed bricks for the fireplaces. The joinery and carpentry was all done on the premises. Mr. Sidney B. Caulfield is the architect.

REBUILDING IN BLOOMSBURY.—A large block of buildings, to be occupied as offices, has lately been erected by Messrs. Prestige & Co., contractors, at the corner, west, of Southampton-street and High Holborn. The plans and designs were prepared by Mr. H. P. Adams, who also made sketches for the carving executed by Mr. Aumonier.

STAINED GLASS AND DECORATION.

ST. SAVIOUR'S COLLEGIATE CHURCH, SOUTHWARK.—Considerable progress has been made with alterations in St. Saviour's Collegiate Church, Southwark. Mr. Choate, the American Ambassador, who is a Havard man, having expressed a wish to appropriate and fill with painted glass a large window in the chapel of St. John the Divine as a memorial to John Harvard, the iron framework of the window has been removed and stone tracery substituted at his Excellency's expense. The stained glass for the purpose is being made in America under the direction of Mr. Charles F. W. Kim, the American architect, who was educated at Harvard. Meanwhile, Mr. Phillips, of the American Embassy, has issued an appeal to past and present Harvard men for funds wherewith to convert the vestry of the church into a chapel as a further memorial to the founder of the great University in America, who was born in Southwark and baptised in St. Saviour's Church on November 29, 1607.—*Times.*

FOREIGN.

FRANCE.—The Académie des Beaux-Arts has suppressed the system of giving subjects for competition to the students of the French school at Rome. Henceforth they will be at liberty to choose their own subjects for their *envois*.——The Académie has awarded the Achille Leclère prize (architecture) to M. Julian Puthod.——The Government, under the advice of the Under-Secretary of State for Fine Arts, has decided to suspend from his functions M. Thomas, the architect in charge of the Grand Palais des Beaux-Arts. He was one of the three original architects of the building, and has neglected for years to furnish particulars which have long been demanded.——M. Redon, the architect to the Louvre, has established a new lift there to the second story, which will facilitate the access to various galleries that cannot at present be very easily reached by the public.——On the recommendation of the Under-Secretary of State for Fine Arts, the Hôtel de Rohan, in which the Government printing works are at present established, and of which the demolition had been announced, is to be preserved and classed among Monuments Historiques.——The works carried on in the progress of the Metropolitan railway line No. 5 have led to the uncovering of the old foundations of the Bastille, and the piers which formerly carried the drawbridge.——In the early days of May an exhibition is to be opened at the Musée Galliera of wrought iron-work and work in copper and pewter. The exhibition is organised by the Service des Beaux-Arts of the Paris Municipality.——The Municipal Council of Paris is proposing to purchase all the works and sketches left by Dalou, with the object of adding them to the exhibition at the Petit Palais.——The jury of the competition for the laying out of a new park at Nancy has awarded the first premium to the joint design of M. Vacherot, landscape-architect, of Paris, and M. Contal, of the same profession, of Lille.——Parliament is to occupy itself shortly with the question of the rebuilding of the Luxembourg on its present site, to which is to be joined a portion of the garden belonging to the "Petit Luxembourg."——There is talk of rebuilding the Mairie of the XVIIth arrondissement (Batignolles) on its present site.——The Municipal Council of Moulins have commissioned M. Baër, the architect, to carry out a museum there, utilising the pavilion of Anne de Beaujeu. The cost is estimated at 317,000 francs.

MISCELLANEOUS.

WHITWORTH AND CITY ART GALLERIES, MANCHESTER.—By the testamentary dispositions of the late Mrs. Mary Worthington, of Sale, Chester, and Vice-President of the Union of Manchester University Women Students, a collection of water-colour and other drawings by Turner, Copley Fielding, Samuel Prout, Mulready, Maclise, and others is acquired by the Whitworth Gallery, and the pictures of a "Landscape with Cows," by Turner, and "Ghent," by Calcott, are bequeathed to the Corporation for deposit in the City Art Gallery. The former bequest comprises Prout's "Tournai," and "Würzburg" (two views); Mulready's drawing of his birthplace in Kensington; Maclise's pencil drawings of the Norman Conquest; Fielding's "Old Newby Bridge"; and Turner's "Fonthill," "The Thames at Eton," "St. Mary's, Malvern," "Llanberis Lake," "Norham Castle," "Easeby Abbey, Yorkshire," and three views of Cassiobury Park, Hertfordshire.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 16th inst., at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Brondesbury, St. Laurence, Middlesex, 150*l.* for the first portion; Cwmllynfell, St. Margaret, Carmarthenshire, 100*l.*, in lieu of a former grant of 75*l.*; and Saltney Ferry, near Chester, 80*l.* for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Barton Mills, St. Mary, near Mildenhall, Suffolk, 30*l.*; Llantwit Major, St. Illtyd, near Cardiff, 50*l.*; and Prestatyn, Christ Church, Flints, 55*l.* A grant was also made from the Special Mission Buildings Fund towards building a mission church at Abertillery, St. John, 25*l.* The following grants were also paid for works completed:—Prestwich, St. Hilda, near Manchester, 75*l.*; East Bridgford, Hants, St. Peter, near Nottingham, 25*l.*; Eastleigh, Church of the Resurrection, Hants, 50*l.*, making in all 250*l.*; Wandsworth, St. Mary the Virgin, Surrey, 150*l.*; and Woodstone, St. Augustine, near Peterborough, 20*l.* In addition to this, the sum of 220*l.* was paid towards the repairs of seventeen churches from trust funds held by the Society. The Annual General Court of the Society will be held on Thursday, May 4, at the Church House, Dean's-yard, Westminster, at 3 p.m., when the chair will be taken by the Lord Bishop of St. Albans.

AUSTRIAN MARBLE, CEMENT, AND ASPHALT.—Mr. H. L. Churchill, the British Consul, in his report on the trade and commerce of Trieste for the year 1904, mentions that the Trieste Marble Company, whose work really began some eighteen months ago, has now been legally formed. The quarry is situated on Monte Planik, in Istria, and produces a very solid and beautiful marble. One section of the quarry contains a white marble with a dim pink shade, whilst another section supplies an almost white marble with light pinkish

and yellow veins. The quality of the marble is not yet widely known, but where samples have been sent it has created quite a sensation, and trial orders have been promptly forthcoming. Blocks of almost any size can be supplied. Samples will be sent on application. Rough blocks have only been supplied thus far, but machinery is being ordered so that, in 1905, orders for polished work can be executed. At the Momiano, Istria (three hours by rail from Trieste) a beautiful marble quarry has been discovered. The quarry has never been worked, and is for sale. Another marble quarry, discovered lately at Momiano, is working. The Austrian cement export is of no great importance. The factories are too far from the sea, so that they cannot always successfully compete with foreign countries. On the other hand, new manufactories are continually springing up in other countries, thus causing an over-production. Still the cement manufactories of the Alpine regions of Austria will have sufficient work for three or four years, as they are supplying the necessary cement for the construction of the Tauri railway (to be ready towards the end of 1907). A large cement manufactory has been erected at Lengerfeld (North Carniola), in the Trieste consular district. The yearly production is about 3,000 railway truck loads. A large establishment is to be erected near Albona (Istria) for the manufacture of Portland cement entirely for exportation. There are in the neighbourhood immense quantities of stone suitable for the manufacture of cement, and also a coal mine (Carpano-Vines), all situated close to the port of Rabaz. A manufactory of asphalt products has also been lately established.

EXCAVATIONS, CANTERBURY.—The excavations in the Abbey Field behind St. Augustine's College, Canterbury, are to be continued, in spite of the loss involved to this interesting work in the recent death of Canon Routledge. The field, which comprises some 3 acres, includes part of the site of the old Benedictine monastery founded in 598 by King Ethelbert and St. Augustine. It was put up for sale in 1900, and by the efforts of the late Primate, Lord Stanhope, Lord Northbourne, and others, was secured for the Church of England and vested in trustees. The buildings which stood upon it included the Abbey Church, the chapter house, dormitory, infirmary, hall, and chapel, and the early Saxon chapel of St. Pancras, while the church contained several shrines. The sum collected for the purchase by Canon Routledge left 180*l.* for the excavation work, and the trustees raised a further sum of 1,057*l.* With these monies the precincts, which were used as a farmyard, have been gradually dealt with. The crypt of the Abbey Church, with its three circular side chapels, each containing a stone altar, has been cleared, and the work has been extended to the infirmary and other buildings. The funds are now exhausted, and contributions may be sent to the Rev. R. J. E. Boggis, St. Augustine's College, Canterbury.—*Times.*

THE CHEAP COTTAGES EXHIBITION.—The committee of the Exhibition of Cheap Cottages, to be held at Letchworth, Hertfordshire, in July, announce that prizes to the amount of 100*l.* will be given in each class of the building competitions—*i.e.*, for detached cottages, pairs, and groups, built at a cost not exceeding fixed sums. There will also be a special prize of 100*l.* for the best all-round and cheapest cottage suitable for an agricultural labourer, and probably a further substantial prize for the best concrete cottage. The committee will consider plans for cottages to be built at the Exhibition up to April 15. Donations towards the prizes fund will be welcomed, in order to enable the committee to render the prizes more numerous and substantial. All donations, and any inquiries, should be addressed to the London offices of the Exhibition, 347, Birkbeck Bank-chambers, Holborn, W.C.

Legal.

NEWCASTLE ANCIENT LIGHT DISPUTE.

THE case of Cowper and Steel, Coulson, & Co., Ltd., *v.* Milburn and others came before the Court of Appeal, composed of the Lord Chief Justice and Lords Justices Vaughan Williams and Stirling, on the 20th and 21st insts., on the plaintiffs' appeal from the judgment of Mr. Justice Buckley, in the Chancery Division. (The case was reported in the *Builder* of June 18, 1904.)

In this case the plaintiff, Cowper, the freeholder, and the plaintiff Company, the lessees, of Dean Inn, No. 20, Dean-street, Newcastle-on-Tyne, brought the action against the defendants for an injunction to restrain them, their servants, and agents, from continuing the erection of certain buildings so as to cause a nuisance or obstruction to the plaintiffs' ancient lights, as the same were enjoyed previous to the removal of the buildings formerly standing on the site of the defendants' premises. Until recently, on the west side of Dean-street, there were certain buildings of moderate height, and they had been acquired by the defendants and pulled down, and on the site the defendants had erected buildings far exceeding the height of the old buildings. The defence was a denial of liability, and, in the result, Mr. Justice Buckley held that there had been no nuisance on the part of the defendants, and dismissed the action, with costs. Hence the present appeal of the plaintiffs.

Mr. Ralph Neville, K.C., Mr. Astbury, K.C., and Mr. Maughan appeared for the appellants, and Mr. Warrington, K.C., Mr. Buckmaster, K.C., and Mr. O'Leigh Clare for the respondents.

At the conclusion of the arguments of counsel, the Lord Chief Justice said the Court was of opinion that there must be a report made by someone. He did not think, as at present advised, that the right question had been considered by Mr. Justice Buckley, and it was necessary that a report should be made. He and his learned brothers would settle the form of the reference to the person who was appointed to make the report, and when it had been received, the Court would give judgment on the appeal. The report the Court wanted was whether there had been an obstruction of the light, assuming the old windows in the plaintiffs' building were still there.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

4,116 of 1904.—E. CHAUDOIR: *Electrically Controlled Lifts and Hoists.*

Operating the mechanism of electrically controlled lifts and hoists, electrical travelling cranes, transporters, elevators, conveyors, or runway hoists by a circuit-making device at each floor or point, and a series of same in the cage corresponding to the floors electrically connected to forked, cut-out, or direction switches at the intermediate floors or points, said switches being operated by an appliance on the lift cage, the balance weight, crab, or trolley, or other moving part or cage, so that first one of the probable paths or circuits of the current supplying the solenoid or its equivalent, actuating the controlling switch for one direction of the motors' rotation, is automatically cut out, and then the other path for the opposite direction as the cage passes the aforementioned cut-out switches, until the one corresponding to the floor or point where the cage is required to stop at (which is really the only "live" switch) is nearly reached, when, by reason of the shape of the forked cut-out switch lever, the current is actually off.

8,192 of 1904.—J. SHANKS: *Water Supply Taps or Valves.*

Water supply taps or valves, consisting of a valve closing with the pressure water, and an actuated spindle operating a cup leather working in a barrel in the body of the tap, and a spring between the cup leather and the end of the barrel.

8,939 of 1904.—J. G. HALL: *Catches for the Doors of Gates and the like.*

Catches for the doors of gates and the like, characterised by a circular ball, a segment of which projects through a perforation in a face plate, the ball being normally retained against the edge of the perforation by a cup formed in a spring arm which is secured to the inside of the face plate.

9,162 of 1904.—A. MEIKLEJOHN: *Sliding and Folding Doors, Partitions, or Gateways.*

Sliding and folding doors, partitions, and the like, consisting of a wheel device running on trunnions in a rail mounted in a slidable and swivelling piston or plunger, which is carried in a metal shoe, flush with the surface of the door, partition, or the like, in combination with an upper projecting piece fitted on top of door, partition, or the like, provided with a knob, which runs between the two guide rails in a runner beneath the ceiling.

9,331 of 1904.—P. BAINBRIDGE and J. METCALF: *Sanitary Appliances for Use in Connexion with Closets.*

A sanitary appliance, consisting of a container and detachable paper seat covers, means for holding the latter in the container, and means for connecting the container to a pedestal or to an ordinary encased or square-seated closet.

9,350 of 1904.—W. LANAWAY: *Brick-cutting Apparatus.*

This invention relates to brick-cutting apparatus, and has for its object to provide a simple and efficient device for sawing bricks to any required shape, either square, as for ordinary building purposes, or at an angle or bevel for special requirements. A device made in accordance with this invention comprises a box having parts of the sides thereof cut away, a pair of slotted arms mounted on a spindle, and means for holding said arms in position.

9,971 of 1904.—J. WILLIAMS: *An Air-tight Door.*

An air-tight door and door frame, having between the said door and its jamb a resilient pad or beading, against which the said door when shut can be tightly pressed by the action of a resilient fastening device, the fastening device comprising a lever handle adapted to move in a plane approximately parallel to the face of the door, and having its fulcrum or pivot subjected to the action of a spring that tends to keep said lever handle pressed towards the face of the door.

15,903 of 1904.—F. V. BLACKA: *A Method of Pointing or Surface Finishing for Buildings, Bridges, and Walls in Brick or Stonework, New or Old and Dilapidated.*

In carrying out the method of this invention the joints are raked out, the surface is washed down, and the joints, cracks, and holes filled in with a material stained to colour required, composed of Portland cement and pure oxide of iron, or oil mastic, Parian or Keens' cement, and levelled with face of brick or stonework. Then the whole is stained with suitable flat colours for imitating red, blue, or buff brickwork.

24,204 of 1904.—J. W. SEVKERSON: *Kitchen Ranges and the like.*

This invention relates to kitchen grates and ranges in which access can easily be obtained to the flues so that they may be quickly and easily cleaned, while being rendered air-tight and smoke-proof by the panels covering the same. The invention consists essentially in providing the back and top part of the grate or range with detachable panels covering the apertures to the flues, the said panels when removed exposing the flues, thereby simplifying cleaning and making the fixing much more secure and easy.

9,195 of 1904.—H. BICKLEY: *Construction of Fireproof Walls and Partitions of Buildings.*

Constructing a fireproof wall or partition, consisting in the use of a number of slabs formed with V-shaped tongues and grooves, connecting the adjacent edges of the slabs with liquid cement, and laying in the joints a bed of washed sand and cement, floating the slabs into position, coating the top edge of the uppermost line of slabs and the corresponding parts of the ceiling and walls or woodwork with liquid cement, and filling the space between the slabs and the ceiling with a fixing material.

9,292 of 1904.—PATENT VICTORIA STONE PAVING COMPANY and F. W. LAWS: *Moulds for the Manufacture of Paving Slabs.*

This invention relates to moulds for the manufacture of paving slabs, and has for its object to facilitate the opening of the moulds, for the removal of the slabs, and the subsequent replacement of the parts. The mould has the ledges forming the sides of the mould partially fixed to the bottom and partially movable, the movable sides being firmly fixed together so that they can be moved in one piece. The said movable sides are secured to the fixed sides at opposite corners by means of thumb screws, which are passed through them and adapted to engage in nuts or plates fitted tightly into the ends of the fixed ledges, suitable notches being formed either in the fixed ledges or in the movable ledges so as to ensure the movable parts being applied in the proper position.

10,808 of 1904.—W. H. BARTON: *Fireproof Flooring.*

A fireproof flooring, consisting of a centring, comprising a number of metal strips, bands, wires, or the like, coiled or wrapped round the joists, and running between said joists in a plane parallel to the lower surface of the floor, and designed to support thin sheets of metal or other material.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 3.—By LANGRIDGE & FREEMAN (at Horley).

Horley, Surrey.—99 to 107 (odd), Albert-rd., f., w.r. 66*l.* 6s. £850

March 6.—By LANGRIDGE & FREEMAN (at Edenbridge).

Edenbridge, Kent.—Church-st., "The Brewhouse Cottages" (four), f., w.r. 44*l.* 17s. 590

March 7.—By PERKINS & SONS (at Southampton).

Southampton.—Hill-la., f.g. rents 31*l.* 15s., reversion in 980 and 988 yrs. 774

Hill-la., perpetual yearly rent-charges of 49*l.* 15s. 1,216

March 9.—By ELLIOTT & SONS (at Brighton).

Brighton.—1, 2, and 3, Richmond-gdns., f., w.r. 58*l.* 10s. 710

19 and 20, London-st., f., w.r. 49*l.* 8s. 665

6, Blackman-st., f., w.r. 24*l.* 14s. 360

14, Montreal-rd., f., w.r. 22*l.* 2s. 285

33 and 34, Argyle-rd., f., w.r. 67*l.* 12s. 795

12, 13, and 14, Guildford-st., f., w.r. 92*l.* 6s 1,285

3, Ditchling-rd., f., e.r. 30*l.* 365

2 and 3, Regent-hill, f., w.r. 61*l.* 2s 710

Hove.—5 and 5½, Brunswick-st. West, f., w.r. 52*l.* 520

9, Lower Market-st., f., e.r. 39*l.* 420

Hurstpierpoint, Sussex.—Chinese-la., "Stonecot," f., e.r. 40*l.* 540

March 13.—By JOHN BARKER & CO.

Kensington.—60, Stratford-rd., u.t. 56¼ yrs., g.r. 9*l.*, e.r. 70*l.* 500

By THURGOOD & MARTIN.

Belgravia.—1, Motcomb-st. (s.), u.t. 19 yrs., g.r. 4*l.*, y.r. 121*l.* 4s. 1,275

2 and 3, Motcomb-st., u.t. 19 yrs., g.r. 8*l.*, y.r. 200*l.* 2,610

4, 5, 6, 7, and 8, Motcomb-st. (s.), u.t. 19 yrs., g.r. 20*l.*, y.r. 460*l.* 5,645

9, Motcomb-st., u.t. 19 yrs., g.r. 6s., y.r. 120*l.* 1,140

Hyde Park.—11, Fulton-mews, u.t. 65 yrs., g.r. 15*l.*, e.r. 70*l.* 250

March 14.—By H. J. BROMLEY.

Norwood.—34 to 50 (even), Thornlaw-rd., f., y.r. 335*l.* 5,040

3, 14 to 26 (even), Casewick-rd., f., y.r. 305*l.* 4,460

1 to 6, Belmont Cottages, f., w.r. 156*l.* 1,745

By H. DONALDSON & SONS.

Islington.—76, 80, and 82, Church-rd., u.t. 32 yrs., g.r. 15*l.*, y.r. 148*l.* 1,250

Stoke Newington. — 89, Mildmay-pk., u.t. 49½ yrs., g.r. 7*l.*, y.r. 42*l.* 420

Dalston.—31, Holly-st. (s.), with yard and stabling, u.t. 18 yrs., g.r. 32*l.*, p. 120

Clapton.—71, Median-rd., u.t. 63 yrs., g.r. 6*l.*, y.r. 36*l.* 330

By H. KEMP.

Dulwich.—1 and 3, Lacon-rd., u.t. 70 yrs., g.r. 14*l.*, y.r. 60*l.* 530

90 and 92, Lancroft-rd., u.t. 61 yrs., g.r. 10*l.*, y.r. 60*l.* 365

Peckham.—190 and 192, Cator-street, u.t. 21½ yrs., g.r. 6*l.*, w.r. 70*l.* 4s. 275

143, Kirkwood-rd., u.t. 60¾ yrs., g.r. 6*l.*, w.r. 39*l.* 250

By ROGERS, CHAPMAN, & THOMAS.

Westminster.—5, Allington-st., u.t. 17¼ yrs., g.r. 5*l.* 5s., y.r. 50*l.* 310

By STEPHENSON & ALEXANDER (at Cardiff).

Dinas Powis, Glamorgan. — "Brookland House" and 6 a. 0 r. 33 p., f. 2,350

Three closes of building land, 7 a. 2 r. 34 p., f. 2,370

By J. T. PEAT (at Reigate).

Reigate, Surrey.—"Antwerp Lodge" and "Norfolk Lodge," u.t. 46¼ yrs., g.r. 10*l.*, y.r. 125*l.* 1,175

40, Effingham-rd., f., w.r. 20*l.* 16s. 350

2, 3, and 4, Nutley-gr., f., w.r. 57*l.* 4s. 610

By DYER, SON, & HILTON (on the Premises).

Lee.—65, Burnt Ash-hill, u.t. 59 yrs., g.r. 14*l.* 10s., e.r. 95*l.* 795

March 15.—By HAROLD GRIFFIN.

Battersea.—3 and 4, Russell-st., u.t. 56 yrs., g.r. 8*l.*, w.r. 67*l.* 12s. 490

14 and 15, Frances-st. (s.), u.t. 46 yrs., g.r. 6*l.*, w.r. 52*l.* 250

Clapham.—5, Marjorie-gr., u.t. 88 yrs., g.r. 8*l.*, y.r. 42*l.* 345

Battersea.—69 and 71, Sugden-rd., u.t. 80 yrs., g.r. 14*l.*, y.r. 70*l.* 655

By LINNETT & LANE.

Maida Hill.—19, Park-pl. Villas, u.t. 32 yrs., g.r. 2*l.*, e.r. 80*l.* 500

Harlesden.—45 and 47, Minet-av., u.t. 87 yrs., g.r. 13*l.*, y.r. 72*l.* 750

49, Minet-av., u.t. 82 yrs., g.r. 7*l.*, y.r. 36*l.* 368

3, Cecil-rd., u.t. 80¾ yrs., g.r. 6*l.* 10s., y.r. 34*l.* 290

Wembley, Middlesex.—London-rd., "Averley," u.t. 98 yrs., g.r. 6*l.*, e.r. 32*l.* 317

By WAGSTAFF & SONS.

Islington.—65, Oxford-rd., u.t. 47½ yrs., g.r. 7*l.*, y.r. 46*l.* 430

33, Almorah-rd., u.t. 47½ yrs., g.r. 10*l.* y.r. 48*l.* 390

By G. C. PHILLIPS and PROTHEROE & MORRIS (at Hockley).

Hockley, Essex.—Portions of the Harrogate estate, 53 a. 0 r. 19 p., f. 2,160

By STEPHENSON & ALEXANDER (at Newport).

Llanhilleth, Monmouth.—Two pieces of building land, 2 a. 3 r. 8 p., f. 190

Two freehold cottages, 2 a. 3 r. 30 p. 620

Freehold ground rents of 15*l.* 4s. 9d., reversion in 71, 77, and 87 yrs. 420

Three building plots, area 12,738 yds., f. .. 1,710

Two freehold cottages 330

Joinery works and builder's yard, f., y.r. 30*l.* 600

"Glandwr Farm," 9 a. 0 r. 12 p., f. 2,000

A mineral estate, area 56 a. 3 r. 12 p., beneficial leases for 14 yrs. 4,800

March 16.—By J. BARTON & CO.

Camberwell.—39 and 41, Picton-st., u.t. 58½ yrs., g.r. 10*l.*, w.r. 70*l.* 4s. 365

By BLAKE & DANNATT.

Greenwich.—30, Blackheath-rd. (s.), f., y.r. 50*l.* £935

1 to 4, Queen's-cottages, u.t. 34½ yrs., g.r. 14*l.*, w.r. 78*l.* 415

Greenwich.—20, Ashburnham-rd., u.t. 42 yrs., g.r. 4*l.* 4s., e.r. 25*l.* 230

62, Ashburnham-gr., u.t. 41 yrs., g.r. 4*l.* 4s., y.r. 28*l.* 280

By HOLLIDAY & STANGER.

Streatham.—21, Hopton-rd., u.t. 76 yrs., g.r. 9*l.*, y.r. 70*l.* 510

Woodford.—Sydney-rd., "Sydney Villa," f., y.r. 65*l.* 1,005

By LAMBERT & CO.

Holloway.—Citizen-rd., "The Cottage," u.t. 37¼ yrs., g.r. 7*l.*, e.r. 36*l.* 240

27 and 29, Corrinne-rd., u.t. 63 yrs., g.r. 10*l.* 10s., y.r. 80*l.* 750

By NEWBON, EDWARDS, & SHEPHARD.

Kensington.—101, Edith-rd., u.t. 70½ yrs., g.r. 2*l.*, y.r. 50*l.* 530

49, Comeragh-rd., u.t. 71 yrs., g.r. 10*l.*, y.r. 50*l.* 395

Notting Hill.—73, Lansdowne-rd., f., y.r. 70*l.* 900

Islington.—28, Gibson-sq., u.t. 22¼ yrs., g.r. 9*l.*, e.r. 48*l.* 255

Pimlico.—60, Tachbrook-st., u.t. 22 yrs, g.r. 8*l.*, e.r. 60*l.* 425

Walthamstow.—59 to 73 (odd), Carisbrook-rd., u.t. 76 yrs., g.r. 30*l.*, w.r. 208*l.* 1,200

By STIMSON & SONS.

Peckham.—62 to 76 (even), Peckham-rd., area 42,500 ft., f., y.r. 452*l.* 6,500

Hampstead-road.—92 and 94, Stanhope-st., u.t. 10 yrs., g.r. 10*l.*, y.r. 98*l.* 260

Clapham.—327, Clapham-rd., f., e.r. 70*l.* 810

Peckham.—Choumert-rd., f.g. rents 12*l.* 12s., reversion in 74 yrs. 340

Copleston-rd., f.g. rents 12*l.* 12s., reversion in 75 yrs. 340

By WILLDER & WILLDER.

Tottenham Court-road.—1, Fitzroy-st., u.t. 23½ yrs., g.r. 90*l.*, y.r. 160*l.* 430

By H. J. BLISS & SONS.

Dalston.—5, Albion-ter, u.t. 34 yrs., g.r. 4*l.*, y.r. 28*l.* 250

Hackney.—5, Martello-ter., u.t. 69 yrs., g.r. 5*l.* 10s., w.r. 32*l.* 10s. 225

41 and 43, Lesbia-rd., u.t. 78¼ yrs., g.r. 6*l.* 10s., y.r. 66*l.* 625

56 North-st. f., w.r. 28*l.* 12s. 285

Stoke Newington.—17, Aden-gr., u.t. 65½ yrs., g.r. 5*l.*, y.r. 36*l.* 390

By EDWIN EVANS (at Battersea).

Pimlico.—127, St. George's-rd., u.t. 23 yrs., g.r. 14*l.*, y.r. 80*l.* 606

50, Bessborough-st., u.t. 28¾ yrs., g.r. 10*l.* 10s., e.r. 65*l.* 550

10, Bessborough-mews, u.t. 38 yrs., g.r. nil, y.r. 34*l.* 295

Battersea.—282 and 284, Queen's-rd., u.t. 69¾ yrs., g.r. 21*l.*, p. 450

23 and 25, Marjorie-gr., u.t. 88½ yrs., g.r. 15*l.* 10s., y.r. 82*l.* 710

Wandsworth.—38 to 52, 56 to 66 (even), The Gr., u.t. 89 yrs., g.r. 98*l.*, y.r. 464*l.* 4,345

Tooting.—25 to 31 (odd), Sellincourt-rd., u.t. 93½ yrs., g.r. 12*l.* 12s., w.r. 88*l.* 8s. 575

By WYATT & SON (at Emsworth).

Emsworth, Hants.—13, Bridge-rd., f., p. 275

By STEPHENSON & ALEXANDER (at Cardiff).

Cardiff, Glamorgan.—Whitchurch-rd., f.g. rents 120*l.* 10s., reversion in 89 to 98 yrs. (in one lot) 3,050

March 17.—By HOLCOMBE, BETTS, & WEST.

St. John's Wood.—Boundary-rd., i.g. rents 50*l.* 8s., u.t. 32½ yrs., g.r. nil 825

Canonbury.—Canonbury Pk. North, i.g.r. 35*l.* 14s., u.t. 31½ yrs., g.r. 4*l.* 520

By RIDER & SONS.

Lambeth.—6 and 7, Thorne-st., u.t. 27¼ yrs., g.r. 10*l.*, w.r. 84*l.* 10s. 365

45, Thorne-st., u.t. 27¼ yrs., g.r. 6*l.*, w.r. 44*l.* 4s. 180

Notting Hill.—4, Silchester-st., u.t. 58½ yrs., g.r. 5*l.* 10s., w.r. 36*l.* 8s. 220

Willesden.—2 and 4, Waldo-rd., f., w.r. 67*l.* 12s. 700

21 to 31 (odd), Letchford-gdns., f., w.r. 187*l.* 4s. 2,100

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 24.

Architectural Association.—Mr. A. Needham Wilson on "Sketch Plans and Working Drawings." 7.30 p.m.

Royal Institution.—Professor G. H. Bryan, F.R.S., on "The Coming Renaissance of Mathematics," illustrated. 9 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) "The Wanki to Victoria Falls Section: Victoria Falls Railway," by Mr. C. T. Gardner; (2) "Design of a Double-line Plate-girder Railway Bridge," by Mr. H. S. Coppock. 8 p.m.

SATURDAY, MARCH 25.

Architectural Association.—Visit to Shipping Offices, Cockspur-street, and Government Buildings, Parliament-street.

Edinburgh Architectural Association.—Visit to Inveresk and Musselburgh.

Royal Institution.—Professor J. J. Thomson, F.R.S., on "Electrical Properties of Radioactive Substances," III. 3 p.m.

Builders' Foremen's Association.—Mr. F. Jay on "Concrete." 8.30 p.m.

MONDAY, MARCH 27.

Society of Arts (Cantor Lecture).—Mr. H. Laws Webb on "Telephony," III. 8 p.m.

Surveyors' Institution.—Mr. F. Oliver Lyons, M.A., on "The Rating of Railways—their Over-Taxation; its Causes and its Remedies." 8 p.m.

TUESDAY, MARCH 28.

Architectural Association.—Students' Smoker, Monico, Piccadilly-circus. 9 p.m.

Royal Institution.—Professor W. E. Dalby, M.A., on "Engineering Problems," II. 5 p.m.

Society of Arts (Colonial Section).—The Hon. Walter Hartwell James, K.C., Agent-General for and late Premier of Western Australia, on "The Manufactures of Greater Britain—II. Australasia." 4.30 p.m.

Institution of Civil Engineers.—Mr. C. S. Russell Palmer on "Coolgardie Water Supply." 8 p.m.

WEDNESDAY, MARCH 29.

Society of Arts.—The Right Hon. Sir Herbert Maxwell Bart., M.P., on "British Woodlands." 8 p.m.

Architectural Association (Discussion Section).—Mr. K. Gammell on "The Planning of Buildings and the Safety of the Public." 7.30 p.m.

Edinburgh Architectural Association.—Councillor D. M'Arthy on "The Royal Mile—the Castle to Holyrood," illustrated by lantern slides. 8 p.m.

Institution of Civil Engineers.—Students' visit to the works of the Vauxhall Bridge, in course of construction. Assemble at the works, north side of the river, 2.30 p.m.

THURSDAY, MARCH 30.

Society of Antiquaries.—8.30 p.m.

FRIDAY, MARCH 31.

Institution of Mechanical Engineers.—An extra meeting, when the "First Report to the Steam-Engine Research Committee," by Professor David S. Capper, will be further discussed. 8 p.m.

SATURDAY, APRIL 1.

Incorporated British Institute of Certified Carpenters.—Mr. S. B. Savill on "Construction of Bridges," illustrated by lime-light views. 6.15 p.m.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Controverted Questions of Optics," I. 3 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks.	1	12	0	per 1000	alongside,	in river.
Rough Stocks and Grizzles	1	8	0	,,	,,	,,
Facing Stocks ...	2	5	0	,,	,,	,,
Shippers	2	5	0	,,	,,	,,
Flettons	1	8	0	,,	at railway depôt.	
Red Wire Cuts ...	1	14	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire ...	4	4	0	,,	,,	,,
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks.....	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	12	0	0	,,	,,	,,
Headers	11	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	16	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers...	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers...	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,

BRICKS, &c. (*continued*).

		£ s. d.	
Splays, ferred,	Cham- Squints	14 0 0	per 1000 at railway depôt.
Second White Dipped Glazed	Quality and Salt	2 0 0	,, less than best.
		s. d.	
Thames and Pit Sand		7 0	per yard, delivered.
Thames Ballast		5 9	,, ,,
Best Portland Cement		27 0	per ton, ,,
Best Ground Blue Lias Lime		20 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8¼	,, ,,
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	,, ,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	,, ,,
	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt
Beer ,,	1 6	,, ,,
Greenshill ,,	1 10	,, ,,
Darley Dale in blocks...	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks	2 10	,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super. ,,
6 in. rubbed two sides ditto, ditto	2 6	,, ,,
3 in. sawn two sides slabs (random sizes)	0 11½	,, ,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides ditto	3 0	,, ,,
3 in. sawn two sides (slabs random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,
	s. d.	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 ,, ,,	13 17 6	,, ,,
20 × 10 first quality ,,	13 0 0	,, ,,
20 × 12 ,, ,, ,,	13 15 0	,, ,,
16 × 8 ,, ,, ,,	7 5 0	,, ,,
20 × 10 best blue Portmadoc	12 12 6	,, ,,
16 × 8 ,, ,,	6 12 6	,, ,,
20 × 10 best Eureka unfading green	15 17 6	,, ,,
20 × 12 ,, ,,	18 7 6	,, ,,
18 × 10 ,, ,,	13 5 0	,, ,,
16 × 8 ,, ,,	10 5 0	,, ,,
20 × 10 permanent green	11 12 6	,, ,,
18 × 10 ,, ,,	9 12 6	,, ,,
16 × 8 ,, ,,	6 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles ...	3 7	per doz. ,, ,,
Best Brosely tiles	50 0	per 1000 ,, ,,
Do. Ornamental tiles	52 6	,, ,, ,,
Hip and Valley tiles ...	4 0	per doz. ,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 ,, ,,
Do. Ornamental do	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 0	,, ,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 ,, ,,
Do. Ornamental do	54 6	,, ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1000 ,, ,,
Best Ornamental tiles	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 ,, ,,
Do. pressed	47 6	,, ,, ,,
Do. Ornamental do	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 6	,, ,, ,,

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13 10 0	15 0 0
Deals: best 3 by 9	13 0 0	14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,

WOOD (*continued*).

	At per load of 50 ft. £ s. d.	£ s. d.
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 0 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 10 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in	24 0 0	25 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in by 11 in.	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	12 0 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens.	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens.	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	14 0 0
Do. 3 in. by 9 in.	12 10 0	14 0 0
Battens.	10 0 0	11 0 0
White Sea and Petersburg :—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, battens	10 0 0	11 0 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	40 0 0	upwards.
Oddments	28 0 0	,,
Seconds, regular sizes	30 0 0	,,
Yellow Pine oddments	25 0 0	,,
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	0 3 6
Small ,, ,,	0 2 6	0 2 9
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
¾ in. do. do.	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	5 15 0 ...	6 15 0
Compound Girders, ordinary sections	7 5 0 ...	8 7 6
Steel Compound Stancheons	9 2 6 ...	10 12 6
Angles, Tees and Channels, ordinary sections	7 7 6 ...	8 7 6
Flitch Plates	7 15 0 ...	8 5 0
Cast Iron Columns and Stanchions including ordinary patterns	6 12 6 ...	7 15 0

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	7 0 0 ...	7 10 0
Staffordshire Crown Bars, good merchant quality	7 10 0 ...	8 0 0
Staffordshire "Marked Bars"	9 10 0 ...	—
Mild Steel Bars	8 5 0 ...	8 15 0
Hoop Iron, basis price	8 15 0 ...	9 0 0
,, ,, Galvanized	16 10 0 ...	—
(*And upwards, according to size and gauge.)		
Sheet Iron, Black— Ordinary sizes to 20 g.	9 0 0 ...	—
,, ,, 24 g.	10 0 0 ...	—
,, ,, 26 g.	11 15 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 0 0 ...	—
,, ,, 26 g.	14 0 0 ...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	15 10 0 ...	—
,, ,, 22 g. and 24 g.	16 0 0 ...	—
,, ,, 26 g.	17 10 0 ...	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
,, ,, 22 g. and 24 g.	13 0 0 ...	—
,, ,, 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 0 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 0 0 ...	—
,, ,, ,, 26 g.	13 10 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	15 2 6 ...	—
Pipe in coils	15 12 6 ...	—
Soil pipe	18 2 6 ...	—
Compo pipe	18 2 6 ...	—
ZINC—Sheet— Vieille Montagne ...ton	30 15 0 ...	—
Silesian	30 10 0 ...	—
COPPER— Strong Sheet...per lb.	0 0 10 ...	—
Thin ,, ... ,,	0 0 11 ...	—
Copper nails ... ,,	0 0 10 ...	—
BRASS— Strong Sheet... ,,	0 0 9½ ...	—
Thin ,, ... ,,	0 0 10 ...	—
TIN—English Ingots ... ,,	0 1 4½ ...	—
SOLDER—Plumbers' ... ,,	0 0 6½ ...	—
Tinmen's ... ,,	0 0 8 ...	—
Blowpipe ... ,,	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, fourths	2d. ,, ,,
21 oz. thirds	3¾d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4¾d. ,, ,,
,, fourths	3¾d. ,, ,,
32 oz. thirds	5¾d. ,, ,,
,, fourths	5d. ,, ,,
Fluted Sheet, 15 oz.	3¼d. ,, ,,
,, 21 oz.	4¼d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
⅜ ,, ,, ,,	2¼d. ,, ,,
½ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 6
,, ,, ,, in barrels	,,	0 1 7
,, ,, ,, in drums	,,	0 1 9
Boiled ,, ,, in pipes	,,	0 1 8
,, ,, ,, in barrels	,,	0 1 9
,, ,, ,, in drums	,,	0 1 11
Turpentine, in barrels	,,	0 3 4
,, in drums	,,	0 3 6
Genuine Ground English White Lead	per ton	19 15 0
Red Lead, Dry	,,	19 5 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXVII. (July to December, 1904) was given as a supplement with the issue for January 14 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BLACKHILL (Durham).—For alterations and additions to the Clerk's House, Cemetery, Blackhill, for Benfieldside, Consett, and Kintsley Joint Burials Committee. Mr. J. J. Eltringham, architect, Bishoply House, Blackhill:—

J. Westgarth ..	£831 0 0	J. Tully	£751 10 0
T. Gallaghar ..	816 8 0	W. Ayton & Sons*‡.....	743 0 0
J. Eltringham..	804 0 0		
W. Snowdon ..	758 13 8		

[All of Blackhill].

‡Accepted, and after certain deductions were made, a contract for £597 was entered into.

CHUCKERY.—For low-pressure heating apparatus to new schools, Chuckery, for the Walsall Education Committee. Messrs. Bailey & McConnal, architects, Walsall:—

E. Manton, Walsall* £270

COUNDON.—For erecting a Roman Catholic Elementary School at Coundon, Bishop Auckland. Mr. J. Keenan, architect and surveyor, North Bondgate, Bishop Auckland:—

W. Hope & Son	£2,176 15 0	Walton Bros.	£1,737 12 9
P. C. Scott ..	1,964 10 7	T. Manners, Bishop Auckland*‡	1,707 16 9
W. Walton ..	1,839 0 0		
W. Hudson..	1,811 18 1		

‡ This includes Mr. Atkinson's (bricklayer and mason, Coundon) tender of £881 12 9, Manners being sole.

GREAT MISSENDEN (Bucks).—For billiard-room, for Mr. Alfred Dunhill. Mr. J. Bruce Merson, architect, 76, High-road, Kilburn, N.W.:—

M. Dymock	£508 10	G. Parsons	£475 0
H. J. Wright	498 0	Aldridge & Son*	404 0

HANDSWORTH.—For making Endwood Court-road, for the Urban District Council. Mr. H. Richardson, Surveyor, Council House, Handsworth, Birmingham:—

Fitzmaurice & Co., Ltd.	£462	Currall, Lewis, & Martin	£344
J. Hunt	405	J. White, jun.....	319
Sutherland & Thorpe	388	A. Cooper, Birmingham*.....	310
S. Wood	379		

LEDBURY.—For laying 725 yds. of stoneware sewers, and for making a new road from Bye-street to Catley's-lane, for the Ledbury Freehold Building Society. Mr. R. G. Gurney, Surveyor, Worcester-road, Ledbury. Quantities by Surveyor:—

G. Griffiths ..	£1,135 0 0	Creewys & Hobrough..	£754 15 0
T. & C. Panter	1,026 8 6	G. Hill	726 12 0
R. W. Hunter & Co.	930 3 8	J. A. Meredith	715 0 0
H. Davies & Son	880 18 0	H. G. Holloway	670 0 0
J. G. Porter..	857 0 0	G. Emery....	646 16 0
W. Smith....	824 0 0	W. James, Colwall* ..	614 1 0
Johnson Bros.	767 11 2		

LONDON.—For making-up roadways and paving footways of Napier-avenue (section 2), Rannoch-street, and Lochaline-street, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

	Roadway.	Footway.
(a) Lochaline-street.		
H. J. Greenham	£634 ..	—
J. Mears	598 ..	—
G. Wimpey & Co.	589* ..	—
Surveyor's estimate.....	— ..	£205*
Imperial Stone Co.	— ..	199
(b) Rannock-street.		
H. J. Greenham	399 ..	—
G. Wimpey & Co.	397 ..	—
J. Mears	395* ..	—
Surveyor's estimate	— ..	106*
Imperial Stone Co.	— ..	99
(c) Napier-avenue.		
H. J. Greenham	343 ..	—
J. Mears	298* ..	—
G. Wimpey & Co.....	277 ..	—
Surveyor's estimate.....	— ..	105*
Imperial Stone Co.	— ..	99

LONDON.—For addition to coal store at the North-Western Fever Hospital, Lawn-road, Hampstead, N.W., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

G. Wilby	£147 0 0	J. F. Holliday .	£101 0 0
G. Parker	139 0 0	W. J. Coleman & Co.	94 10 0
Aldridge & Son	120 11 0	Sycamore Works, Ltd., 88, Worple-road, Wimdon*	86 8 0
J. Christie	119 14 6		
T. Cole	116 19 0		
Cowley & Drake	115 0 0		
Gardner & Hazell	114 0 0		
Chappell & Co.	113 19 0		

LONDON.—For enlargement of Willesden Sorting Office:—

		Credit Old Materials.
E. J. Clayton	£1,945 10 0 ..	£91 10 0
G. Neal	1,832 0 0 ..	20 0 0
Snewin Bros. & Co. ..	1,740 0 0 ..	174 0 0
J. E. Johnson & Son .	1,668 0 0 ..	20 0 0
C. Ansell.....	1,650 0 0 ..	30 0 0
W. J. King	1,604 16 0 ..	74 16 0
B. E. Nightingale	1,590 0 0 ..	50 0 0
General Builders, Ltd.	1,589 0 0 ..	22 0 0
W. Norton	1,580 0 0 ..	25 0 0
Pollard & Brand	1,580 0 0 ..	125 0 0
J. Christie	1,574 10 0 ..	76 0 0
Speechley & Smith ..	1,570 0 0 ..	90 0 0
Banyard & Son.....	1,558 0 0 ..	78 0 0
F. T. Churchen & Co.	1,544 0 0 ..	95 0 0
Aldridge & Son	1,515 0 0 ..	77 0 0
Martin, Wells, & Co..	1,498 0 0 ..	18 0 0
E. A. Roome & Co. ..	1,495 0 0 ..	46 0 0
T. Pearce	1,490 0 0 ..	—
G. Wiggs.....	1,486 0 0 ..	102 0 0
Cowley & Drake	1,391 16 3 ..	53 7 6
C. Simmons	1,367 0 0 ..	69 0 0
J. Shelbourne & Co.*.	1,316 0 0 ..	24 0 0

LONDON.—For the rebuilding of No. 171, Strand, W.C., for Messrs. Salmon & Gluckstein. Messrs. Thomson & Pomeroy, architects, 49, Hill-road, Wimbledon:—

		Time for Completion. Weeks.
Imperial Tobacco Co. Works Department	£5,968 10 ..	34
Howard & Co.	5,300 0 ..	30
Holloway Bros., Ltd.	5,200 0 ..	26
W. H. Lorden & Son	5,089 0 ..	36
Carmichael & Co.	5,078 0 ..	24
Higgs & Hill	4,984 0 ..	24
Perry Bros.....	4,857 0 ..	24
T. Holloway*	4,559 0 ..	25
Patman & Fotheringham..	4,555 0 ..	30

LONDON BOARD OF EDUCATION TENDERS.

FOR PAINTING AND CLEANING SCHOOLS DURING THE EASTER HOLIDAYS.

Bethnal-green, N.E., Pritchard's-road (Painting Interior and Exterior).

A. Porter	£678	Stevens Bros.	£548
A. W. Derby	618	J. Haydon & Sons, Durham Works, Teesdale-street, Hackney-road* ..	520
Barrett & Power....	600		
W. Shurmur & Sons, Ltd.	574		
W. Silk & Son.....	558		

Bermondsey, Webb-street (Painting Interior).

H. J. Williams ..	£408 0	E. Proctor, 326, High-street, Plumstead* ..	£223 0
W. Hayter & Son	374 10		
W. Banks	372 19		
W. Sayer & Son .	318 10		

Camberwell, N., George-street (Painting Interior and Exterior).

T. L. Green ..	£689 0 0	Maxwell Bros., Ltd.....	£451 3 4
H. J. Williams	642 12 0	J. & C. Bowyer	411 0 0
J. F. Ford	527 0 0	W. King & Son, 3, Vauxhall Bridge-road*	394 0 0
Lathey Bros...	501 0 0		
W. V. Goad ..	477 0 0		
J. R. Sims	457 10 0		

Deptford, Trundley's-road (Painting Interior).

H. L. Holloway	£271 0 0	W. Hayter & Son	£188 7 6
T. D. Leng....	247 0 0	H. Groves, Stockwell-st., Greenwich*..	185 0 0
W. Banks	224 0 0		
S. Musgrove ..	192 10 6		
W. J. Howie ..	189 0 0		

Greenwich, Randall-place (Painting Interior of Old Portion, and Cleaning Interior of New Portion).

W. Harris	£362 0 0	W. J. Howie ..	£275 0
R. Woollaston & Co.	340 0 0	W. Hayter & Son, 62, Banning-street, East Greenwich*	265 9 6
H. L. Holloway	339 0 0		
T. D Leng....	308 0 0		
W. Banks	287 18 6		
C. G. Jones ..	281 0 0	H. Groves	254 0 0
S. Musgrove ..	277 17 0		

Hammersmith, "Victoria" (Painting Interior).

G. Neal	£519 0 0	General B'lders, Ltd.....	£298 0 0
W. R. & A. Hide	443 0 0	Bristow & Eatwell	287 0 0
F. Chidley & Co., Ltd....	420 10 0	G. H. Sealy, 38, Silchester-rd.*	268 10 0
S. Polden	359 12 0	F. T. Chinchen & Co.	254 0 0
W. Brown & Sons	328 13 6		
W. Hornett ..	328 0 0		

Islington, S., Hanover-street (Painting Interior).

Patman & Fotheringham, Ltd. ..	£535 0	J. Grover & Son	£387 0
L. H. & R. Roberts	527 0	Stevens Brothers	372 15
F. W. Harris & Co., Ltd.....	520 0	A. Porter	355 0
G. S. S. Williams & Son	492 0	W. Chappell	340 0
McCormick & Sons	484 0	Barrett & Power, St. Thomas' Works, Hackney*	310 0
Marchand & Hirst	396 0		

Kensington, N., Oxford-gardens (Painting Interiors and Exteriors of old Portion and Enlargement).

G. Neal	£719 0 0	S. Polden	£393 0 0
Lole & Co.	670 18 6	W. Brown & Sons.....	392 4 3
H. C. Clifton ..	638 0 0	Thompson & Beveridge ..	388 0 0
J. Peattie	543 0 0	F. T. Chinchen & Co., Berens-road, Kensal-green*	344 0 0
W. R. & A. Hide	439 15 0		
Bristow & Eatwell	425 0 0		
G. H. Sealy ..	419 10 0		

HENDON.—For supply of Leicestershire granite, for the Urban District Council:—

—	2-in. Granite.	Midland Railway. Mill Hill	Midland Railway. Hendon	Midland Railway. C' Wood	G.N.R. Mill Hill	Extra for 1½-in. gauge per ton.
		Per ton s. d.	Per ton s. d.	Per ton s. d.	Per ton s. d.	
Cliffe Hill Granite Co., Ltd.*	Cliffe Hill	10 9	10 9	10 9	11 1	3d.
Whitwick Granite Co., Ltd.	Whitwick	11 0	11 0	10 9	10 10	same price.
Mountsorrel Granite Co., Ltd.	Stoney Stanton	10 9	10 9	10 9	10 9	—
Groby Granite Co., Ltd.*	Groby	10 8	10 8	10 8	10 8	3d.
B. J. Forder & Son	Marston Hall	11 0	11 0	11 0	11 0	3d.
Croft Granite, Brick, etc., Co.‡	Croft	11 0	11 0	11 0	11 0	—
Enderby & Stoney Stanton Granite Co.	Enderby or Stoney Stanton	11 0	11 0	11 0	11 0	3d.
Enderby & Stoney Stanton Granite Co.	Narborough	11 0	11 0	11 0	11 0	3d.
Enderby & Stoney Stanton Granite Co.	Earl Shilton	11 6	11 6	11 6	11 6	3d.
G. A. Watson & Co.	Enderby or Stoney Stanton	10 8	10 8	10 8	—	1s. 3d.

‡ Received late.

HENDON.—For supply of Guernsey, etc., granite, for the Urban District Council:—

—	Granite.	Midland Railway. Mill Hill.	Midland Railway. Hendon.	Midland Railway. Crickle-wood.	Great Northern Railway. Mill Hill.	Great Northern Railway. Finchley.	Great Northern Railway. Edgware.	Extra for 1½-in. gauge per ton.
		Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	d.
L. Sommerfeld	Guernsey Granite‡	15 5	14 9	14 6	15 5	15 3	15 9	6
A. & F. Manuelle	Guernsey Granite	13 11	13 9	13 8	14 8	14 6	15 0	—
Fry Bros.	Guernsey Granite	14 2	14 2	14 0	14 11	14 9	15 2	6
J. Mowlem & Co.	Guernsey Granite	14 1	14 0	13 11	14 9	14 8	14 11	6
W. Griffiths & Co.*	Guernsey Granite	13 6	13 4	13 2	14 2	14 1	14 6	—
Fidd & Mackay	Clee Hill Granite and Clee Hill Dhu Stone	15 0	15 0	15 0	15 1	15 8	15 8	—
Clee Hill Granite Co.	Clee Hill Granite and Clee Hill Dhu Stone (machine broken)§	15 1	15 0	15 0	15 8	15 8	15 8	—
Clee Hill Granite Co.	Clee Hill Granite and Clee Hill Dhu Stone (hand broken) §	15 7	15 6	15 6	16 2	16 2	16 2	—
J. Wainwright & Co.	Basalt (Morris Hill)§	14 6	14 3	14 3	14 6	14 7	14 7	6
J. H. Dickson	Basalt, best Devonshire (machine broken)	15 0	14 10	14 10	—	—	—	8
	Basalt, best Devonshire (hand broken)	16 0	15 10	15 10	—	—	—	6
J. H. Dickson	Trusham Granite (machine broken)	14 5	14 3	14 3	—	—	—	8
	Trusham Granite (hand broken)	15 5	15 3	15 3	—	—	—	—
Tar Macadam (Purnell Hooley's Patent) Syndicate, Ltd. (R. V. Parker, Agent)	Tarmac	15 9	15 9	15 9	16 9	16 8	16 10	—
Clee Hill Dhu Stone Co.	Clee Hill Dhu Stone (machine broken)	15 1	15 0	15 0	15 8	15 8	15 8	—
Clee Hill Dhu Stone Co.	Clee Hill Dhu Stone (hand broken)	15 7	15 6	15 6	16 2	16 2	16 2	—
G. A. Watson & Co., Ltd.	Clee Hill Granite	15 3	15 2	15 2	—	—	—	—
Rowley Regis Granite Quarries	Rowley Regis	13 6	13 11	13 6	13 6	13 6	13 6	2

‡ From Crown Quarries, Alderney, Port of Guernsey. § Received late.

TENDERS.—*Continued on page* 337.

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Power Station at Llwynypia	Glamorgan Coal Co., Ltd.	A. O. Evans, Williams, & Evans, Architects, Pontypridd	Mar. 27
Schools, Clarksfield	Oldham Corporation	H. Cheetham, Architect, Prudential-buildings, Union-st., Oldham	do.
Boilers, Economisers, Pumps, Tanks at Workhouse	Newcastle-on-Tyne Guardians	Newcombe & Newcombe, Architects, 89, Pilgrim-street, Newcastle	do.
Road Works, George-street, Farncombe	Guildford R.D.C.	J. Anstee, Engineer, Council Offices, Guildford	do.
Brick and Concrete Piers, Mill Stream, Rickford	do.	do.	do.
Additions to House, Blundell's School, Tiverton	The Governors	E. F. C. Clarke, Clerk to Governors	do.
Ironmongery Stores, Stoneware Goods, etc.	Ogmore and Garw U.D.C.	H. D. Williams, Council Surveyor, Brynmenyn	do.
300 lineal yds. of Wrought-Iron Road Fencing	do.	do.	do.
Internal Painting, etc., Central Fire Station, Nelson-st.	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker-bldgs., Brewery-st., Bradfd.	do.
Minister's House, etc., Moeltryfan	Hermon Independent Chapel Com.	E. F. White, Architect, 27, Bangor-street, Carnarvon	do.
Six Houses at Ryhill, Barnsley	.....	E. W. Dyson, Architect, 14, Market-hill, Barnsley	do.
Two Small One-Story Shops, Broad-street	Deal Corporation	Borough Surveyor's Office, 23, Queen-street, Deal	do.
Pipes (Bentham Water Supply Works)	Settle R.D.C.	T. A. Foxcroft, Engineer, Town Hall, Settle	do.
Alters. & Furniture, Town Clerk's Office, Town Hall	Leeds Corporation	City Engineer's Office, Leeds	Mar. 28
Road Works, Wellesley-road, Ilford	Ilford U.D.C	H. Shaw, Engineer, Town Hall, Ilford	do.
400 tons Guernsey Granite Spalls	Brentford Guardians	W. Stephens, Clerk, Union Offices, Isleworth	do.
A Livesey Washer	Stockport Gas and Electricity Com.	S. Meunier, Engineer, Stockport	Mar. 29
Alterations, etc., Mill Premises, Grove Mills, Morley	Messrs. David Bradley, Ltd.	T. A. Buttery & S. B. Birds, Architects, Queen-street, Morley	do.
Hydraulic Lift Pumps, etc., Whips Cross Infirmary	West Ham Guardians	F. E. Hilleary, Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
Ten Houses, Langley Park, Co. Durham	Messrs. White & Lowes	G. T. Wilson, Arch., 22, Durham-road, Black Hill, Co. Durham	do.
Granite	Hallaton R.D.C.	J. H. Douglass, Clerk, Market Harborough	do.
Steelwork for Two Outside Emergency Staircases, etc.	Leeds Guardians	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Wrought-Iron Balconies, Grilles, Gates, and Railings	do.	do.	do.
Galvanised Clothes-Rack Frames	do.	do.	do.
Concrete Bed & Wood & Stone Paving, Beckett-st.	do.	do.	do.
Materials	Oxford Corporation	W. H. White, City Engineer, Oxford	do.
Rea Valley Flood Relief Scheme (Contract No. 3)	Birmingham Corporation	J. Price, City Engineer, Council House, Birmingham	do.
Disinfectants	Cannock R.D.C.	T. F. Pickering, Inspector, Oxley-pl., Bushbury-la., Wolverhamp.	do.
Broken Granite	do.	H. M. Whitehead, District Surveyor, Penkridge, Stafford	do.
Road Metalling	Aylesbury U.D.C.	W. H. Taylor, Surveyor, Town Hall, Aylesbury	do.
Building Materials	do.	do.	do.
Ironwork	do.	do.	do.
Tools, Stores, etc.	do.	do.	do.
Labour	do.	do.	do.
*Branch Library, Lille-road	Fulham Borough Council	Council's Engineer, Town Hall. Fulham, S.W.	do.
300 yds. of 18-in. Cast-Iron Pipes	Stockport Gas and Electricity Com.	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	Mar. 30
Electrical Feeder Cables	do.	A. J. H. Carter, Borough Electrical Engineer, Millgate, Stockport	do.
Furniture and Furnishings, Male Hospital, Melrose	Roxburgh District Board of Lunacy	House Steward at Asylum	do.
Cement Path Work	Gateshead Corporation	W. Swinburne, Town Clerk, Gateshead	do.
Materials, Stores, etc.	Newcastle-on-Tyne Corporation	Tramways Department, Head Office, Manors, Newcastle-on-Tyne	do.
Flints for Road Material	Guildford Corporation	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	do.
Portland Cement	do.	do.	do.
Two Shops and Dwellings, Margaret-st., Abercynon	.....	A. Ll. Thomas, Engineer and Architect, Pontypridd	do.
Scavenging	Wortley R.D.C.	G. E. Beaumont, Surveyor to Council, Grenoside	do.
New Road (350 yds. of Front-st., etc.) Huddersfield	.....	G. & G. H. Crowther, Engineers, 38, New-street, Huddersfield	do.
New Road (300 yds. of Front-street), Huddersfield	.....	do.	do.
Farmhouse at Mann Aish, South Brent	.....	Mr. Kingwell, Mann Aish, South Brent	do.
Mortuary & Disinfector Buildings, High School Yds.	Edinburgh Corporation	R. Morham, City Architect, Public Works Office, Edinburgh	do.
Offices at Risca Collieries, Cross Keys, Mon.	United National Collieries, Ltd.	Colliery Offices, Exchange-buildings, Cardiff	do.
Road Materials	Gravesend Corporation	F. T. Grant, Borough Surveyor, Town Hall, Gravesend	do.
Road Materials	Chatham Town Council	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Drain Pipes	do.	do.	do.
Carpenters' and Joiners' Work	Brighton Corporation	F. J. C. May, Borough Engineer, Town Hall, Brighton	Mar. 31
Smiths' and Ironfounders' Work	do.	do.	do.
Painters' and Glaziers' Work	do.	do.	do.
Temperance Hall, Allendale Town	.....	Badenoch & Bruce, Archs., Emerson-chbrs., Blackett-st., Newc.-T.	do.
Eight-brake Horse-power Oil Engine, etc	Halstead U.D.C.	W. A. Nicholson, Surveyor, Halstead, Essex	do.
Two Sets Refractory Cells, Inebriates' Reform., Cattal	Yorkshire Inebriates' Act Joint Com.	J. Vickers Edwards, Architect, County Hall, Wakefield	do.
Sewage Tanks	Houghton-le-Spring U.D.C.	J. W. Holbrook, Surveyor to Council, Houghton-le-Spring	do.
Wiring New Council Schools, Liverpool-st., Leedley	Salford Corporation	Borough Electrical Engineer, Frederick-road, Pendleton	do.
Sanitary Blocks, Parkside Asylum, Macclesfield	.....	H. Beswick, County Architect, Newgate-street, Chester	do.
Church, Elgin	.....	W. C. Reid, Architect, Elgin	do.
Additions, etc., 52, South Mall, Cork	Incorp. Ch. of Ireland, Cork Y.M.A.	W. H. Hill & Son, Architects. 28, South Mall, Cork	do.
Detached Residence, Anysome, Grange-over-Sands	Mr. J. S. Remington	Harrison, Hall, & Moore, Architects, Lancaster	do.
Chapel, Cwmfelin Monarch, near Llanboidy	.....	Vestry Room, Cwmfelin, Wales	do.
Sewers, etc., Bilton	Rugby R.D.C.	T. W. Willard, Surveyor to Council, Rugby	do.
Excavating, etc., for Gasholder	Woking District Gas Co.	A. Valon, 140, Temple-chambers, London, E.C.	April 1
1,288 sq. yds. Tar-macad., Stanningley & Bramley Pks.	Leeds Corporation	City Engineer's Office, Leeds	do.
Blue Stone and Slag	Pocklington R.D.C.	T. Robson, Clerk, Pocklington	do.
Wain House, Tregenna, Lamorran	Rt. Hon. Viscount Falmouth	Farmhouse at Tregenna	do.
Whinstone	Croft R.D.C.	C. H. Leach, Clerk, Union Offices, Darlington	do.
Leading Stones	do.	do.	do.
Road Materials, Cartage, and Tools	Staffordshire C.C.	J. Moncur, County-buildings, Stafford	do.
Annual Contract	Swinton and Pendlebury U.D.C.	H. Entwisle, Surveyor, Council Offices, Swinton, Manchester	do.
New Hope English Baptist Chapel, Caeran, Maesteg	The Trustees	W. Beddoe Rees, Architect, 3, Dumfries-place, Cardiff	April 3
Stores	Lancashire and Yorkshire Ry. Co.	Mr. Duffin, Stores Department, Osborne-street, Manchester	do.
Two Stone Bridges across Glencoyne and Aira Becks	Cumberland & Westmoreland C.C.	G. J. Bell, County Surveyor, The Courts, Carlisle	do.
Stone Bridge across Kirk Beck, Shopford	Longtown R.D.C.	J. Murray, District Surveyor, Kirklinton, Carlisle	do.
Sewer, etc., at Horley Court Lodge Farm	Governors of Christ's Hospital	F. L. Lightfoot, 23, Abingdon-street, Westminster, S.W.	do.
Alterations, etc., at Rassan Schools, Beaufort	Ebbw Vale Education Committee	H. Waters, Architect, Beaufort	do.
Additions, etc., Briery Hill Schools, Ebbw Vale	do.	do.	do.
Materials	Felixstowe and Walton U.D.C.	H. Clegg, Surveyor. Town Hall, Felixstowe	do.
Carting Granite, etc.	Wangford R.D.C.	F. S. Rix, Clerk, Beccles	do.
Swimming-baths, Pasture-road, Goole	Goole U.D.C.	E. H. Barber, Surveyor, Council Offices, Goole	do.
Broken Granite and Slag	Melton Mowbray R.D.C.	A. H. Marsh, Clerk, Melton Mowbray	do.
Plant, Baldwin Reservoir Works	Douglas Water Committee	F. Thorpe, Manager, Reservoir Works, Douglas	do.
Twelve Houses at Troedyrhiw	The Taff Building Club	W. Dowdeswell, Architect, Treharris	do.
Three Benches of Retorts, Penrhiwceiber Gasworks	Mountain Ash U.D.C.	Surveyor to Council, Town Hall, Mountain Ash	do.
Low-pressure Hot-water Heating Apparatus	New Siloh Chapel Com., Landore	J. Richards, Architect, 54, Mysydd-road, Landore	do.
Temporary School, Beech-street, Winton	Eccles Corporation	E. Parkes, Town Clerk, Town Hall, Eccles	do.
Boundary Wall and Sanitary Conveniences, Winton	do.	do.	do.
Barn, East Fen Farm	Boston Corporation	G. E. Clarke, Borough Surveyor, Municipal-buildings, Boston	do.
Making-up Brettenham-avenue, etc	Edmonton U.D.C.	G. Eedes Eachus, M.Inst.C.E., Town Hall, Lower Edmonton	do.
780 lineal ft. of 9-in. Pipe Sewer, Eton-road	Frinton-on-Sea U.D.C.	E. M. Bates, Surveyor, Council Offices, Frinton-on-Sea	do.
*Supplying and Laying Tar Macadam	Brighton Borough Council	Borough Engineer, Town Hall, Brighton	do.
Chancel, Vestry, etc., All Saints', University-st., Belfast	.....	W. J. Fennell, Architect, 2, Wellington-place, Belfast	April 4
Dutch Barn, Carlisle Cemetery	.....	Clerk to Burial Board, 27, Lowther-street, Carlisle	do.
Alterations, etc., Cwindare Hotel, Cwmparc	Messrs. Treharne	W. D. Morgan, Architect, Victoria-chbrs., Pentre, Rhondda Valley	do.
Caretaker's House, etc., Ebbw Vale	Ebbw Vale Education Committee	T. J. Thomas, Town Surveyor, Ebbw Vale	do.
High and Low Tension Switchboards, Dickinson-st.	Manchester Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester	do.
Materials	Epsom R.D.C.	T. E. Ware, Surveyor, Waterloo-road, Epsom	do.
Public Library at King's Heath	King's Norton & Northfield U.D.C.	A. W. Cross, Surveyor, 23, Valentine-road, King's Heath	do.
Supplies	Blackrock U.D.C.	Surveyor's Office, Town Hall, Blackrock, Co. Dublin	do.
Cartage and other Work	do.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Boiler Flues and Economisers, Pipes, etc.	Hammersmith Borough Council ..	G. Gilbert Bell, Boro. Electrical Engr., 85, Fulham Palace-rd., W.	April 5
Additions to Travellers' Rest Inn, Consett	Mr. T. Clayhills	At the Inn	do.
Works and Materials	Sunderland Corporation	Borough Engineer, Town Hall, Fawcett-street, Sunderland	do.
Registrar's Ho. & Mortuary Chapel on Cemetery Site	Radcliffe U.D.C.	W. L. Rothwell, Engineer, Council Offices, Radcliffe, Lancs.	do.
Materials	Prestwich U.D.C.	W. Nuttall, Surveyor, Chester Bank, Prestwich	do.
Roads, S.-W. Culv., etc., De Winton Est., Llwynypia	.....	R. S. Griffiths, Surveyor, Excelsior-buildings, Tonypandy	do.
*Erection of Schools, Redhill	Reigate Education Committee	J. M. Kennard, 13, Railway-approach, London Bridge, S.E.	do.
*Painting, etc., Work, at Hospital, Hither Green	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*Painting, etc., Work, at Hospital, Woolwich	do.	do.	do.
*Forming New Areas, etc., to Subway, etc., Woolwich	do.	do.	do.
*Iron and Steelwork for Pontoon, Hospital, Dartford	do.	do.	do.
*Oak Fencing, Cast-Iron Posts, at Asylum, Sutton	do.	do.	do.
7½ miles Cast-Iron Water Pipes & Service Reservoir	Arbroath Corporation	Crouch & Hogg, C.E., 53, Bothwell-street, Glasgow	April 6
4 miles Pipes and Service Reservoir	do.	do.	do.
Filtration Material	Radcliffe U.D.C.	W. L. Rothwell, Engineer, Council Offices, Radcliffe, Lancs.	April 7
400-h.p. Triple-Expansion Steam Engine, etc.	Convoy Woollen Co., Ltd.	Convoy, Co. Donegal, Ireland	do.
Stone Bridge, Cwmyglo, Llanarthney	Carmarthen R.D.C.	J. Saer, 7, Hall-street, Carmarthen	do.
Rebuilding York Pool Bridge, Shinfield	Berks C.C.	J. Morris, County Surveyor, Broadway-buildings, Reading	do.
1,200 tons of Norwegian Granite Setts	Liversedge U.D.C.	F. Langley, Engineer, Council Offices, Liversedge	do.
*Smallpox Hospital at Crotton Heath Wood	Bromley & Beckenham Jt. Hos. Bd.	J. Ladds, Architect, 93, Pemberton-road, Harringay, N.	do.
6,500 tons of Honeycombed Slag	Harrogate Corporation	E. W. Dixon, Engineer, 1A, Cambridge-crescent, Harrogate	April 8
6,000 tons of Clinkers (Filtering Material)	do.	do.	do.
Detached Villa, Clare-road, Ystalyfera	.....	A. S. Williams, Architect, Llandilo	April 10
Two Semi-detached Villas, Clare-road, Ystalyfera	.....	do.	do.
Stoneware Pipe Sewers, Paddock Wood	Tonbridge R.D.C.	F. Harris, Engineer, Broadway, Southborough, Tunbridge Wells	do.
Engine House, etc., Paddock Wood Sewage Works	do.	do.	do.
Additions, etc., to Premises, Church-street, Antrim	Mr. J. Braird	W. J. Fennell, Architect, 2, Wellington-place, Belfast	do.
Additions, etc., to 2 Cottages, Ballywalter, Co. Down	Lord Dunleath	do.	do.
2-ft. Narrow-gauge Locomotive, etc.	Edinburgh and Leith Gas Commrs.	Chief Engineer, Gas Works, New-street, Edinburgh	do.
Stores	do.	do.	do.
*Extension of School, Ilford	Essex Education Committee	C. J. Dawson, Architect, 11, Cranbrook-road, Ilford	April 11
*Warehouse Floor, Paddington	Great Western Railway	Company's Engineer, Paddington Station, W.	do.
Decorating and Painting part of Town Hall interior	Halifax Finance Committee	J. Lord, Borough Engineer, Town Hall, Halifax	April 13
Heating Infirmary Buildings at Boston Workhouse	Boston Guardians	J. Rowell, Architect, Church-lane, Boston, Lincs.	April 15
Laundry Machinery, etc.	do.	do.	do.
Stone, etc.	Tenterden Corporation	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden	do.
*New Buildings, etc., Denbigh	N. Wales Counties Lunatic Asylum	T. M. Lockwood & Sons, Foregate-street, Chester	do.
*New Offices, Lewes	East Sussex C.C.	F. J. Wood, County Surveyor, Lewes	April 17
Electric Generating Plant	Clyde Navigation Trustees	G. H. Baxter, Engineer, 16, Robertson-street, Glasgow	do.
*Erection of Iron School	Tottenham Education Committee	G. E. T. Lawrence, Architect, 22, Buckingham-street, W.C.	do.
Infectious Diseases Hospital Extension	Ashton-in-Makerfield U.D.C.	Heaton, Ralph, & Heaton, Architects, Wigan	April 18
*Town Hall Restoration	Borough of Shoreditch	A. W. S. Cross, Architect, 53A, Maddox-street, W.	do.
Reservoir, Midgley Moor, Luddenden	.....	J. Judson & Hudson, Architects, Oakworth, near Keighley	No date.
School at Creanery	.....	Belfast Bank, Antrim (C. M. Taggart, Man., Thornhill, Randalstown)	do.
Two Magazines at Cefn-On, near Caerphilly	.....	Duncan S. Reid, 102, St. Mary-street, Cardiff	do.
Engine House and Boiler, Aberbaidan Colliery	.....	Colliery Office, near Kenfig Hill	do.
Alterations at Cock and Bottle, Bondgate, Otley	.....	T. Winn & Sons, 92, Albion-street, Leeds	do.
Painting and Repairs, Stoke Ash Baptist Chapel	.....	F. Rose, Thwaite, Eye	do.
Alterations to Oddfellows' Inn, Wyke	.....	J. Jackson, Architect, Barry-street, Bradford	do.
Repairs to Explosives Magazine (Masonry & Joinery)	.....	Ammonal Explosives, Ltd., Victoria-buildings, Docks, Cardiff	do.
Grain Warehouses, West Dock, Cardiff	Cardiff Grain Co.	G. A. Birkenhead, Architect, Caledonian-chambers, Cardiff	do.
*Repairs, Painting, etc., to Hotel, Liphook	The Proprietors	W. G. Tower, 12A, High-street, Guildford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Reigate Union	3*l.* 3s. per week	Mar. 31
*Draughtsman	Norfolk Education Committee	2*l.* per week	April 13

Those marked with an (*) are advertised in this number. *Competitions*, iv. xvi. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvi.

TENDERS—*Continued from page* 335.

LONDON BOARD OF EDUCATION—*Continued.*

Hoxton, Wenlock-road (Painting Interior).

McCormick & Sons	£451 0	H. Bouneau	£353 14
F. W. Harris & Co., Ltd.	400 0	Vigor & Co.	335 0
J. Stewart	399 10	Stevens Bros., 1A, Yonge-park, Seven Sisters-road*	328 0
J. Grover & Son	376 0		

Marylebone, W., Capland-street Junior (Painting Interiors and Exteriors of Main and Special Schools).

J. Peattie	£596	Thompson & Beveridge	£398
T. Cruwys	496	W. Johnson & Co., Ltd.	339
W. Densham & Sons	420	W. Chappell	319
G. Foxley	418	F. T. Chinchen & Co, Kensal Green*	288
F. Chidley & Co., Ltd.	410		
Holloway Bros. (London), Ltd.	409		

Newington, W., Rockingham-street (Painting Interior and Exterior).

T. L. Green	£567 0	E. Triggs	£399 0
J. Appleby & Sons	552 0	W. Sayer & Son	395 0
W. V. Goad	516 0	H. Leney & Son	392 10
J. R. Sims	496 0	G. Brittain, 247, Kennington-road*	356 0
Holliday & Greenwood, Ltd.	447 0		

Walworth, Surrey-square (Painting Interior).

J. F. Ford	£443 0	E. Triggs	£310 0
J. Appleby & Sons	393 0	Maxwell Bros., Ltd.	304 9
H. J. Williams	378 0	G. Brittain, 247, Kennington-rd.*	285 0
Holliday & Greenwood, Ltd.	325 0		

Whitechapel, Hanbury-street (Painting Interior).

W. Bouneau	£239 10	J. Haydon & Sons	£175 14
J. F. Holliday	223 0	A. J. Sheffield	138 0
R. Woollaston & Co.	186 0	Vigor & Co., King-street, Poplar*	127 10

Bow and Bromley, Smeed-road (Relaying Floors in Infants' Department).

A. W. Derby	£240 0	Vigor & Co.	£131 10
Acme Flooring & Paving Co. (1904), Ltd.	149 0	Barrett & Power	117 0
H. Bouneau	140 0	J. T. Robey, 194, Bow-road*	93 0

Southwark, W., Lant-street (Painting Interior and Exterior).

Lathey Bros.	£606 0 0	H. Leney & Son	£489 10 0
A. W. Derby	572 0 0	W. Sayer & Sons, 86, New Kent-road*	472 0 0
W. Brown & Sons	536 3 6	G. Brittain	458 0 0
W. Hornett	513 5 0		
J. Greenwood, Ltd.	512 0 0		

For Erecting a School on the Site of Torridon-road, Lewisham.

The accommodation is as follows: Senior mixed school, 382; junior mixed school, 354; infants' school, 388; total, 1,124. (*a*) Senior mixed school (one-story building)—Hall, 57 ft. 8 in. by 26 ft. 6 in. Classrooms, 48, 48, 48, 48, 40, 40, 40, 40, 30. (Drawing class and science rooms will be provided in one of the brick buildings erected for temporary school accommodation.) Heating by low-pressure hot-water apparatus. (*b*) Junior mixed school (one-story building)—Hall, 57 ft. by 25 ft. Classrooms, 56, 56, 50, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus. (*c*) Infants' school (one-story building)—Hall, 54 ft. by 26 ft. 6 in. Classrooms, 50, 50 (babies' room), 48, 48, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fires. Area of site, 97,580 sq. ft. Playgrounds, area per child, senior and junior boys', 66 sq. ft.; senior and junior girls', 50 sq. ft.; infants', 44 sq. ft.:—

Clarke & Bracey	£24,139	J. & C. Bowyer	£20,883
H. L. Holloway	22,607	Patman & Fotheringham, Ltd.	20,733
Thomas & Edge	22,195	W. Johnson & Co., Ltd.	20,512
C. Wall, Ltd.	21,730	Kirk & Randall	20,475
Killby & Gayford	21,723	Holliday & Greenwood, Ltd.	20,449
Holloway Bros. (London), Ltd.	21,038	J. Marsland & Sons	20,248
J. Smith & Sons, Ltd.	21,378	J. Appleby & Sons	20,120
F. & H. F. Higgs	21,330	J. Garrett & Son	19,971
Lathey Bros.	21,310	J. & M. Patrick	19,719
Stimpson & Co.	21,260	Treasure & Son, Cottenham-rd., Upper Holloway*	19,438
J. Greenwood, Ltd.	21,253		
E. Lawrance & Sons	21,138		
W. Downs	20,960		

[The architect's estimate comparable with these tenders is £20,534.]

LONDON.—For the erection of a generating station at South Kensington, for the Commissioners of H.M. Works and Public Buildings:—

Pollard & Brand	£9,100 0	Higgs & Hill, Ltd.	£7,894 0
C. Ford	8,673 0	Waring White Building Co., Ltd.	7,892 0
Banyard & Son	8,597 0	J. J. Wise	7,852 0
W. Willett	8,500 0	W. Wallis	7,797 0
W. Johnson & Co., Ltd.	8,386 0	Holliday & Greenwood, Ltd.	7,677 0
Dean & Co.	8,370 0	Spencer, Santo, & Co., Ltd.	7,598 0
H. Lovatt, Ltd.	8,260 0	Ford & Walton, Ltd.	7,597 0
J. Allen & Sons, Ltd.	8,196 0	W. J. Renshaw	7,595 0
W. Pattinson & Sons	8,143 0	Hudson & Co.	7,518 0
J. E. Johnson & Son	8,050 0	Appleby & Sons	7,500 0
W. H. Lascelles & Co.	8,000 0	Lawrance & Sons	7,420 0
J. Christie	7,991 10	Leslie & Co., Ltd.	7,365 0
Kingerlee & Co.	7,987 0	Bulled & Co.	7,225 0
J. Mowlem & Co.	7,980 0	B. E. Nightingale	7,114 0
Martin, Wells, & Co., Ltd.	7,970 0	Shelbourne & Co.	7,005 0
W. King & Son	7,930 0	Wisdom Bros.	7,000 0
Vigor & Co.	7,897 0		

LONDON.—For the construction of an underground convenience at Shepherd's Bush Green, for the Hammersmith Borough Council. Mr. Hugh Mair, Surveyor, Town Hall, Broadway, W.:—

Mason & Co.	£6,916 0 0	C. Gray	£5,737 16 0
Doulton & Co., Ltd.	6,558 0 0	Chambers Bros.	5,700 0 0
G. Wimpey & Co.	6,090 0 0	W. J. Dickens	5,646 0 0
B. E. Nightingale	5,989 0 0	Martin, Wells, & Co., Ltd.	5,510 0 0
Gardner & Hazell	5,962 4 7	Spencer, Santo, & Co., Ltd.†	5,509 0 0
R. Dean & Co.	5,868 0 0	A. Woods	5,500 0 0
C. Dearing & Son	5,795 0 0	Water Carriage Engineering Co., Ltd.	5,470 0 0
W. J. Renshaw	5,789 0 0	T. Pearce	5,390 0 0
B. Finch & Co., Ltd.	5,750 0 0	C. Cruse & Co.	5,342 0 0

LONDON.—For the erection of lodge and entrance-gates at Denmark Hill, for Mr. J. Wentworth Bell. Mr. W. G. Tutt, architect and surveyor, 18, Ironmonger-lane, E.C. :—

J. Appleby & Sons..	£674	Turtle & Appleton ..	£475
F. G. Minter.....	505		

METHLICK (N.B.).—For erecting a villa, for Mrs. Berry. Mr. J. Cobban, architect, Haddo House, Methlick. Quantities by architect :—

Mason : A. Scroggie, Ellon.....
Joiner : J. Webster, Old Meldrum.....
Slater : W. Fyvie, Ellon .....
Plasterers : J. & J. Hutcheon, Methlick
Plumbers : J. Laing & Sons, Inverurie..
Painters : G. Donald & Sons, Aberdeen
} £1,000

NEWBURGH (N.B.).—For a new Unitarian Free church. Messrs. Thoms & Wilkie, architects, 46, Reform-street, Dundee :—

Masons : A. & T. Craig, Dundee* ..	£1,253	0	0
Joiners : D. S. & J. Anderson, Perth*	531	8	0
Plumber : D. Brown, Dundee*.....	125	0	0
Plasterer : A. Beveridge, Newburgh*	81	15	8
Slater : J. Storrier, Newport-on-Tay*	120	0	0

PAISLEY.—For constructing two filter-beds and a clear water-tank at High Craigenfeoch Filters, near Johnstone, for the Water Commissioners. Mr. J. Lee, engineer, 13, Gilmour-street, Paisley :—

T. Black & Co., Paisley £5,513 0 8

PANGBOURNE (Berks.).—For four cottages at Pangbourne, for Mr. H. O. Gray. Mr. S. Couch-Johns, architect and surveyor, Land-chambers, Reading :—

J. Leech	£1,250	0	P. H. Allnatt ..	£905	0
G. H. Tucker ..	1,145	0	Fisher Bros. ..	885	0
Stokes & Sons .	1,109	10	Trimder & Sons	875	0
E. Carter.....	1,098	16	Batten Bros., Reading*	868	0
East & Hyde ..	981	0			
T. Stimpson ..	920	0			

PURTON (Wilts.).—For erecting a dwelling-house at the Butts, for Mr. A. C. Mussell. Messrs. W. Drew & Sons, architects & surveyors, 28, Regent-circus, Swindon :—

H. Flewelling..	£397	17	6	J. Lay.....	£275	10	0
Barnes & Sons	340	0	0	Little Bros., Cricklade* ..	227	10	0

SANDERSTEAD (Surrey).—For the erection of two pairs of semi-detached houses in Beechwood-road, Sanderstead, for Mr. A. D. MacRae. Messrs. Pepler & Allen, architects, 3, George-street, Croydon :—

J. R. Bex	£3,400	W. Potter	£2,770
Grace & Marsh....	2,859	Worsfold & Sons*..	2,640

SLEAFORD.—For erecting two pairs of cottages at Rauceby Asylum, for the Committee of the Kesteven County Asylum. Mr. Jesse Clare, County Architect, Sleaford. Quantities by County Architect :—

Newton & Cooke	£1,548	9	0
H. Rose & Son	1,401	1	3
T. C. Armstead	1,375	5	8
W. J. Berry..	1,312	0	0
Hockley & Co.	1,275	0	0
Maxey & Son .	£1,242	0	0
A. J. Elmes .	1,140	0	0
H. Pattinson .	1,122	10	3
J. Banks & Son, Sleaford* ..	1,087	1	6

STAMFORD.—For erecting a free library, for the Library Committee of the Council. Messrs. Hall & Phillips, architects, 6, Gt. James-street, Bedford-row, W.C. Quantities by Messrs. Andrews & Read :—

J. Cracknell....	£2,686	0	Brown & Son ..	£2,300	0
J. Gutteridge ..	2,397	0	J. Peasgood....	2,177	0
Kettering Co-operative Builders, Ltd.	2,340	0	J. Woolston....	2,166	0
			Hinson & Co. ..	2,163	15

WALSALL.—For erecting a senior mixed department for 300 children, Milton-street, Palfrey, and new class-rooms and alterations, for the Education Committee. Messrs. Bailey & McConnal, architects, Bridge-street, Walsall. Quantities by architects :—

H. Gough & Son, Wolverhampton £4,175

WALLINGFORD (Berks.).—For erecting private residence at Wallingford, for Mr. G. Peck. Mr. S. Couch-Johns, architect and surveyor, Land-chambers, Reading :—

J. Knight	£1,563	0	Bailey & Sons ..	£968	17
H. W. Godwin	1,537	0	Bosher, Son, & Co.	965	15
F. W. Romain .	1,520	0	W. H. Wheeler ..	866	0
Fisher Bros. ..	1,165	0	Batten Bros.	864	0
Stokes & Sons .	1,138	10	H. Sainsbury, Tilehurst*	852	0
Brasher & Sons	1,003	10			
Stimpson & Sons	1,001	0			

WALSALL.—For senior mixed school, Palfrey, Walsall, and alterations to present schools, for the Walsall Education Committee. Messrs. Bailey & McConnal, architects, Walsall. Quantities by the architects :—

Hadley & Sons....	£5,476	E. Giles & Son....	£4,681
F. L. Jones	5,292	M. A. Lynex	4,660
J. A. Meredith....	5,271	T. Insley	4,633
W. Sapcote & Sons	5,157	G. H. Marshall....	4,599
J. Harley & Son ..	5,137	W. Kendrick & Sons	4,573
J. Dallow	4,900	T. Hardy	4,563
W. Wistance.....	4,886	Gowing & Ingram	4,557
E. Mallin	4,880	G. Jackson	4,498
H. Willcock & Co.	4,843	S. Wootton	4,496
J. Hall & Son	4,841	T. Mason	4,481
W. & J. Webb....	4,824	T. Tildesley	4,444
J. Herbert	4,783	R. Speake & Son..	4,284
Oakley & Coulson	4,781	W. Bishop.....	4,264
Brockhurst & Wood	4,731	H. Gough, Wolverhampton*	4,175
W. H. Gibbs	4,723		
N. Round	4,699		

WALSALL.—For low-pressure heating apparatus to new senior mixed school and present buildings, Palfrey, Walsall, for the Walsall Education Committee. Messrs. Bailey & McConnal, architects, Walsall :—

E. Manton, Walsall‡ £440

[‡ Recommended for acceptance.]

WHEATLEY HILL.—For erecting club premises and caretaker's house, for the Wheatley Hill Workmen's Social Club and Institute. Mr. H. T. Gradon, architect, 22, Market-place, Durham :—

Fountain & Milward..	£2,185	0	0
Walker Bros.	2,185	0	0
E.M. Tweddle	2,120	0	0
J. Browell..	2,020	0	0
Draper & Sons	1,970	0	0
G. Booth ..	1,961	9	11
G. T. Manners	1,948	0	0
R. M. Storey	£1,915	0	0
Braithwaite & Co.....	1,906	5	0
Watt Bros ..	1,874	6	0
H. C. Howe..	1,770	0	0
J. W. Hope.	1,750	0	0
J. G. Bradley	1,732	0	0
W. H. Ayton, Newcastle-on-Tyne*..	1,706	3	0

WIMBLEDON.—For erecting a coal order office station yard, for Mr. T. G. Mason, Wimbledon. Mr. R. B. Rowell, architect, Triangle-corner, East Sheen :—

Whitehead Bros. .	£140	0	W. H. Larman & Son, Alexandra-rd., Wimbledon*	£105	0
Price & Price....	107	10			

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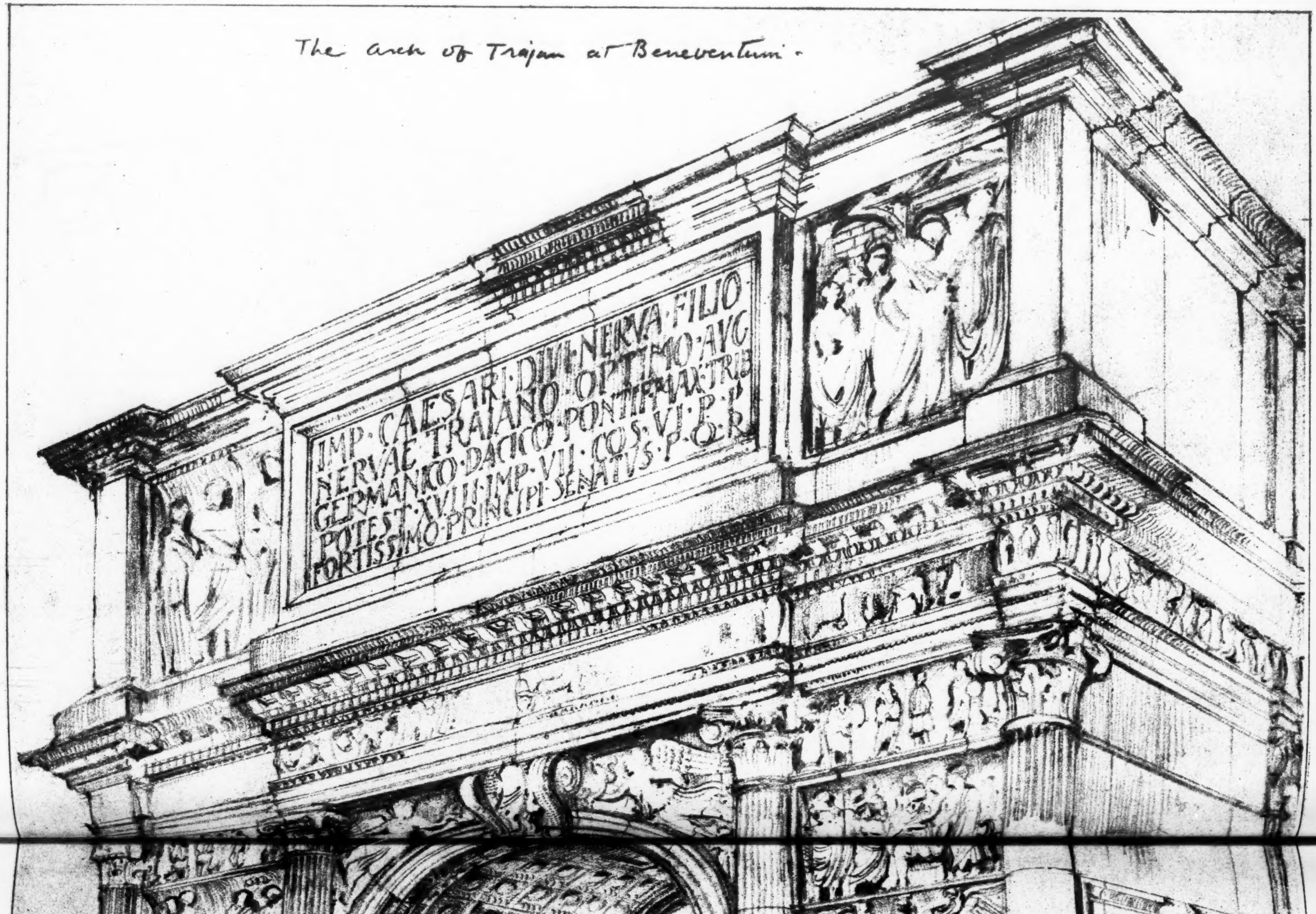
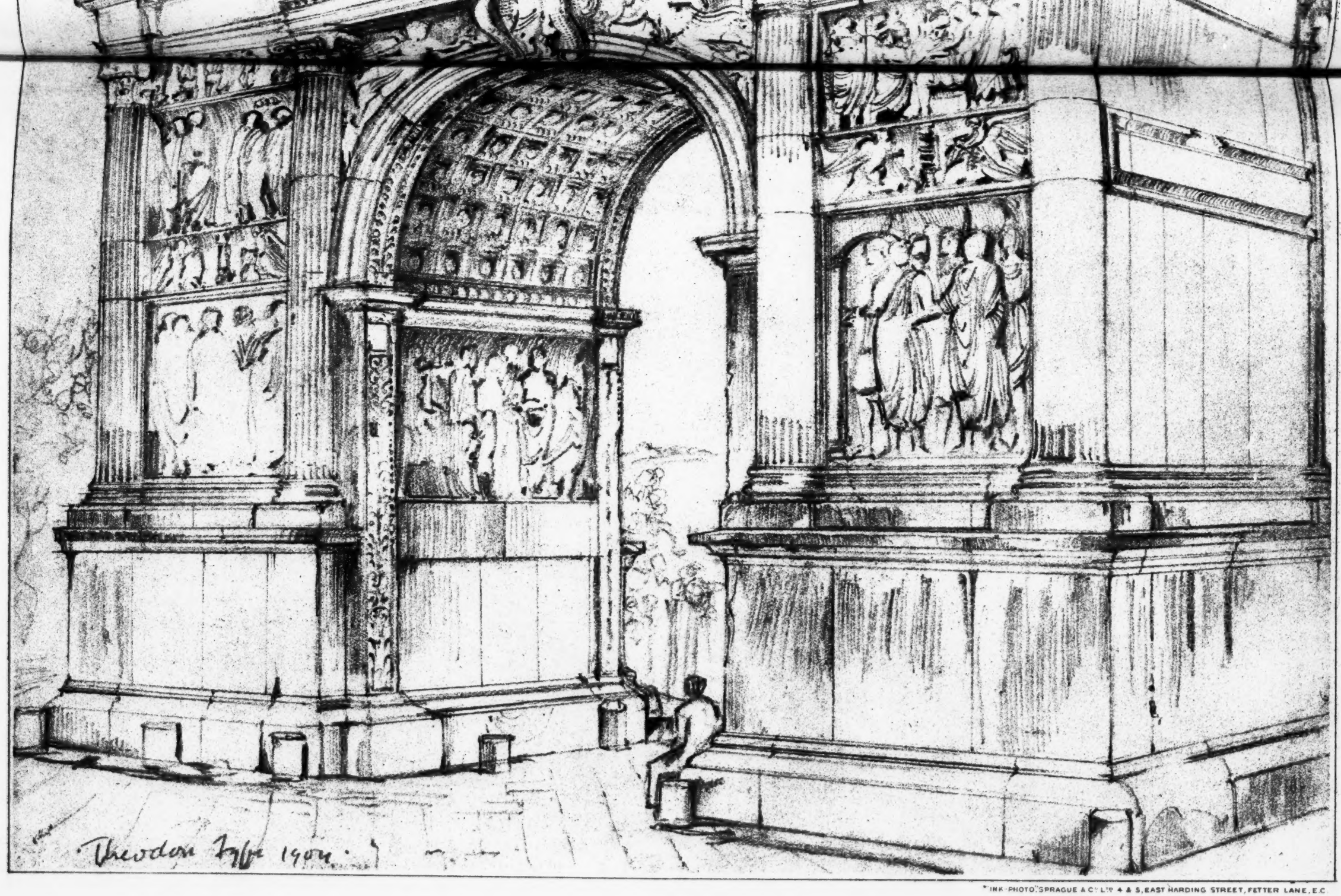
The arch of Trajan at Beneventum.





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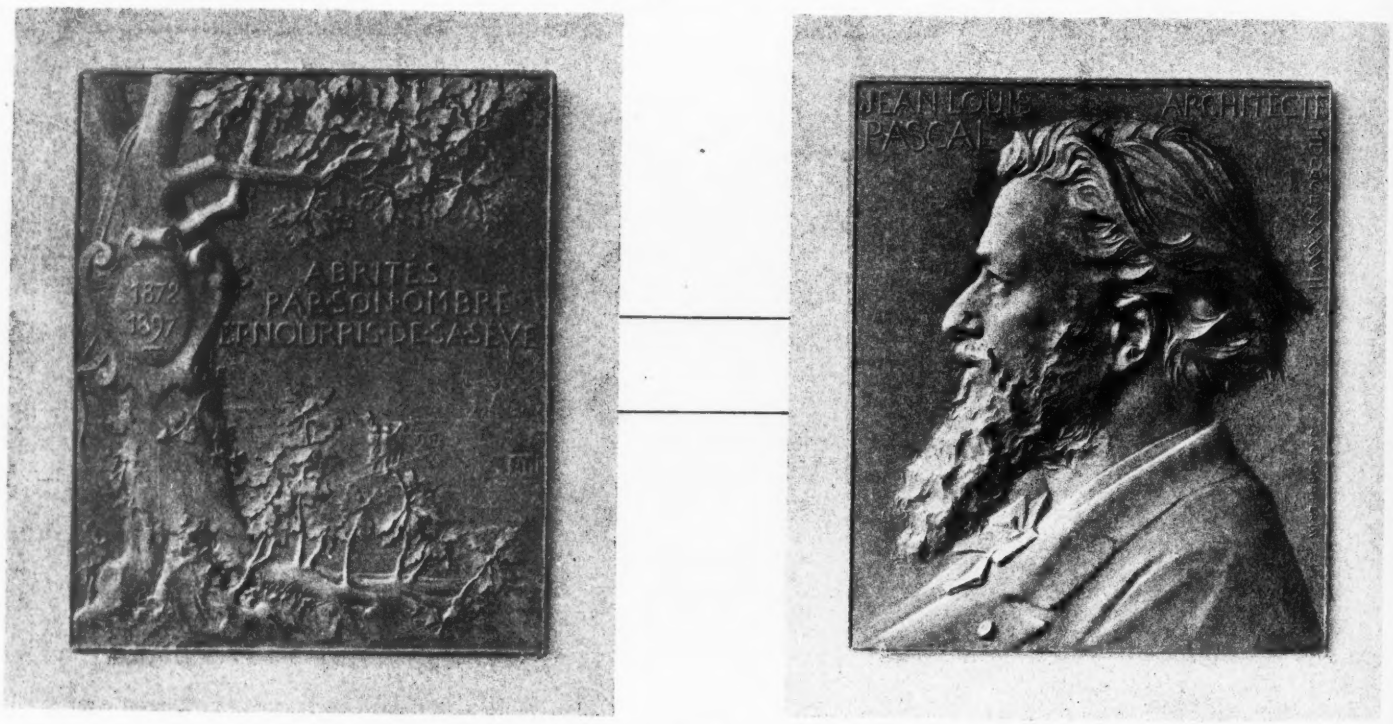

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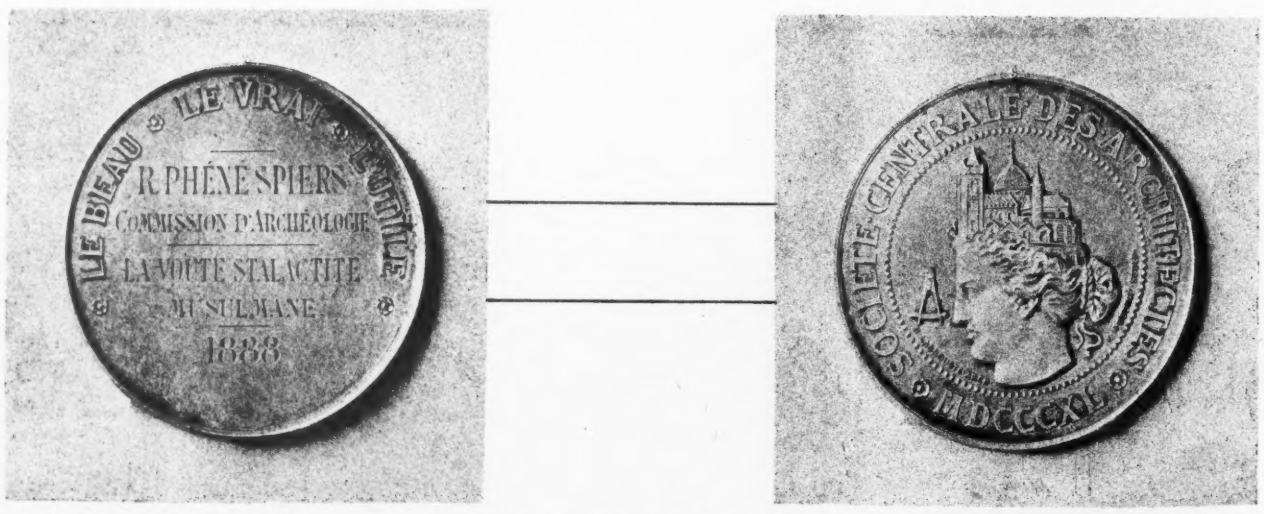

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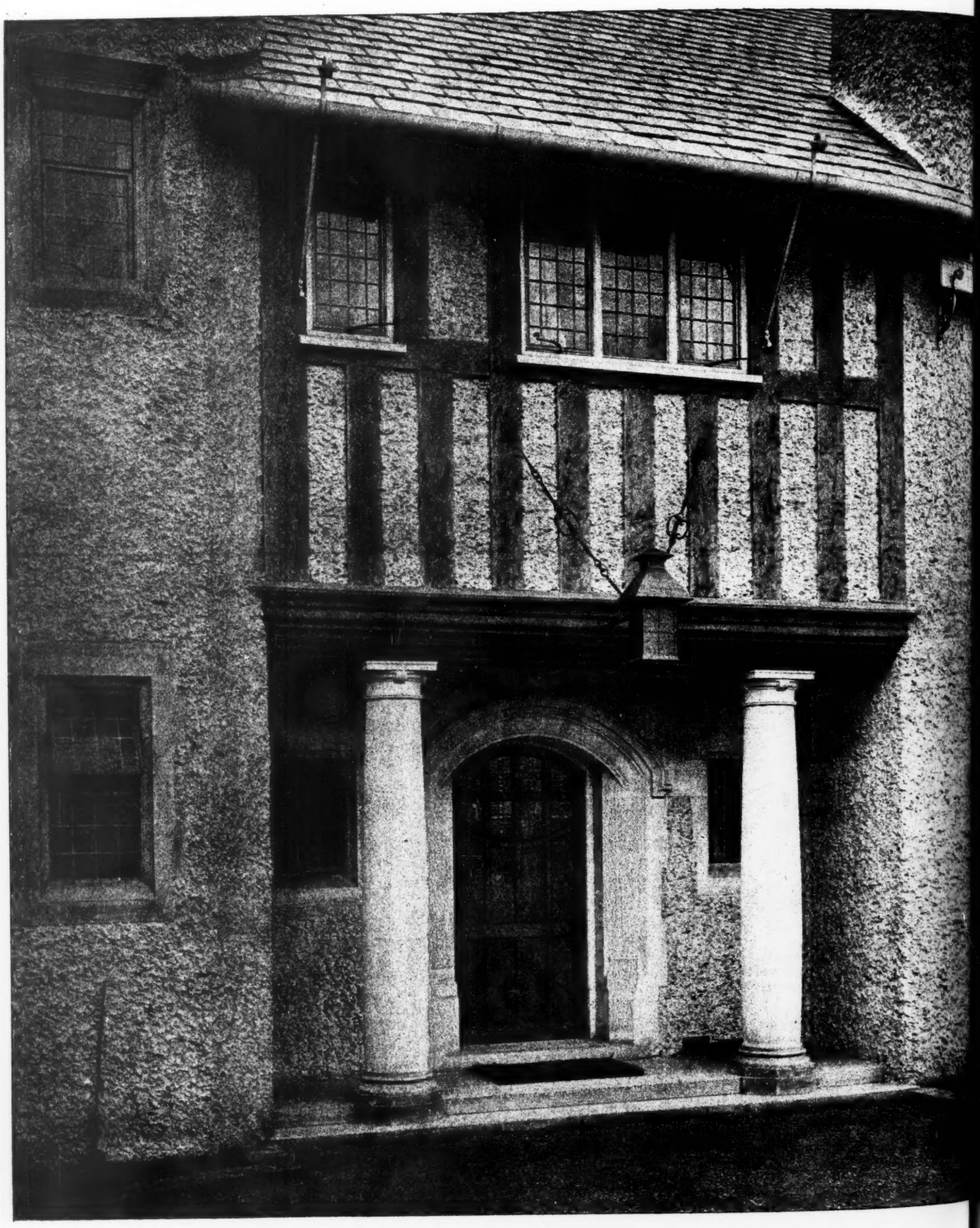

DETAIL OF ENTRANCE.

HOUSE NEAR RUGBY.—[illegible] Simpson, F.R.I.

GENERAL VIEW.

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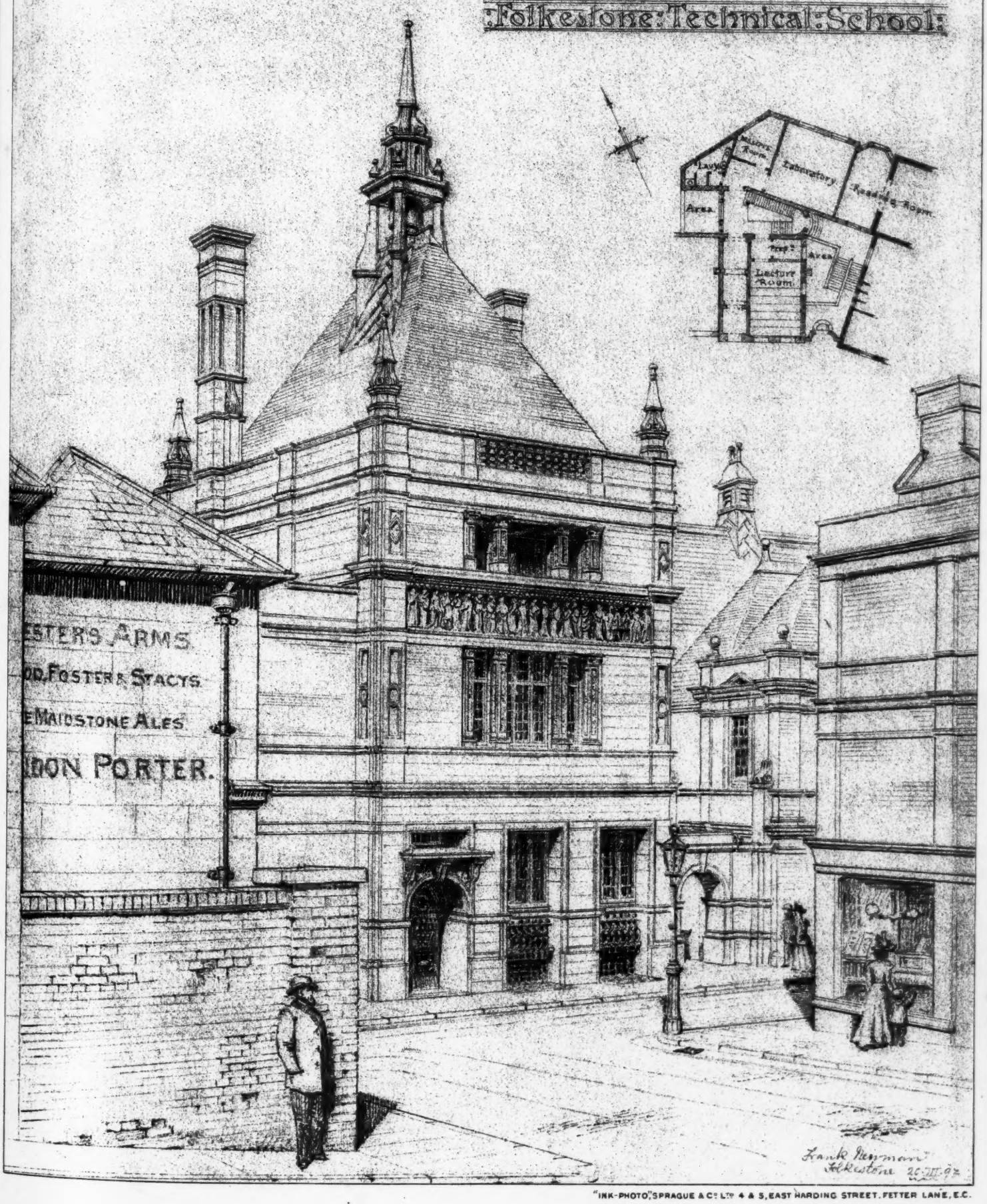

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